NATUR CYMRU
Nature of Wales

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- Dormice
- Bumblebees
- Peatland secrets
- Badgers
- Saltmarshes
- Seicoleg ffwng
- Swallows and martins
- River Dee
- News, Books, Comment...

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NATUR CYMRU
Nature of Wales

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Natur Cymru is intended to promote the exchange of information about biodiversity and encourage debate. If you have information, ideas for articles or artwork which you think might be of interest to readers, please contact the Editor.

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Brown Birch Bolete *Leccinum scabrum*, Orange Birch Bolete *Leccinum versipelle* & Red Cracking Bolete *Boletus chrysenteron*. See p48 for Illustrating Fungi details.
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NATUR CYMRU GOLYGYDDOL

Mae'r rhifyn yma'n cynnwys nifer o erthyglau a gyflwynwyd ar gyfer ein cystadleuaeth *'Natur yn Ysbrydoli'* – maen nhw'n rhy dda i beidio â gweld golau dydd. Tasg anodd, yn sicr, yw dewis pa rai i'w cyhoeddi.

Yn y Sioe Frenhinol eleni, cyflwynodd Iolo Williams y gwobrau i'r rhai a ddaeth yn gyntaf ac yn ail yn y gystadleuaeth, gan dalu teyrnged i ddawn ysgrifennu'r cystadleuwyr a'u brwdfrydedd dros fyd natur. (Gallwch weld fideo o'r seremoni wobrwyo, yn ogystal â'n ffilmiau amgylcheddol, ar U-tube, **www.youtube.com/user/NaturCymru**). Roedd ei ganmoliaeth i'r cylchgrawn yn galonogol iawn – mae geiriau caredig Iolo yn golygu llawer iawn inni.

Ond mae sylwadau trawstoriad o'n tanysgrifwyr yr un mor bwysig inni, sef y rhai a gymerodd ran yn gynharach eleni mewn arolwg ar gyfer darllenwyr. Braf iawn yw gwybod bod y cylchgrawn yn gytbwys a llawn gwybodaeth. Y testun mwyaf poblogaidd ar gyfer erthyglau oedd rhywogaethau unigol. Rydw i'n siŵr y bydd yr erthygl sy'n sôn am brosiect pathewod yng ngogledd Cymru yn ennyn diddordeb nifer ohonoch, ac y byddwch hefyd yn gwirioni ar hanes hoffus un gŵr a'i wenoliaid y bondo.
O ran cyflwyno rhywbeth newydd i'r cylchgrawn, y syniad mwyaf poblogaidd oedd cael tudalen lythyrau.

Cyflwyno gwobrau yn Sioe Frenhinol Cymru • Prize-giving at the Royal Welsh Show

Ychydig iawn o lythyrau rydw i'n eu cael, o bosibl gan nad ydym wedi cynnwys tudalen lythyrau yn y gorffennol. Hoffech chi fwrw eich bol neu ymateb i rywbeth a ddarllenoch chi? Os felly, anfonwch lythyr ataf, gan roi'r deunydd crai imi ar gyfer dechrau tudalen lythyrau!

Un o'n hamcanion yw tanio trafodaethau, felly mae sôn am rywbeth dadleuol bob amser yn syniad da. Roeddwn i'n siomedig, felly, fod un swyddog wedi tynnu erthygl ar gregyn bylchog yn ôl – erthygl a fyddai wedi'i chyhoeddi yn y rhifyn yma. Pam? Gan ei fod, mae'n debyg, yn ofni y byddai gwleidyddion yn flin gyda'i gyflogwr, ac yntau'n awgrymu bod llusgrwydo am gregyn bylchog yn niweidiol. Er 'mod i'n sylweddoli bod hwn yn bwnc sensitif gan fod bywoliaeth pobl yn y fantol, dydw i ddim yn meddwl bod hunansensoriaeth o'r fath o fudd i'r sefydliad dan sylw, nac i'r broses wleidyddol 'chwaith. Yn sicr, dydy o ddim o fudd i'n darllenwyr – nac i'r dudalen lythyrau!

I ddod â rhywfaint o fflach i'r rhifyn, felly, pleser yw gallu cynnwys erthygl yn canmol moch daear, yn ogystal ag un arall yn dadlau yn erbyn codi ffensys yn yr ucheldiroedd. Dylai'r ddwy danio trafodaethau pellach, heb greu gormod o rwyg.

Y flwyddyn nesaf bydd cylchgrawn *Natur Cymru* yn dathlu ei ben-blwydd yn ddeg oed, ac ar sail yr arolwg mae gennym ni ambell nodwedd newydd yn yr arfaeth i ddathlu'r achlysur. Bydd cynnydd bach yn y pris yn dod i rym gyda rhifyn y gaeaf, ond ein bwriad yw parhau i wella'r arlwy a ddarperir yn y cylchgrawn.

James Robertson

NATUR CYMRU EDITORIAL

This issue features several entries for the *Natur Cymru* '*Inspired by Nature*' competition. They are too good not to publish. I am spoilt for choice when it comes to selecting entries for publication.

Iolo Williams gave the prizes to the winner and runner-up at the Royal Welsh Show in July, and paid fulsome tribute to the writing talent and enthusiasm for Welsh nature which the competition had tapped into. (A video of the prize-giving and our own environmental films can be found on YouTube at **www.youtube.com/user/NaturCymru**). His praise for this magazine was truly heartening, as Iolo's comments count for a great deal.

As important, though, have been the comments of a cross-section of subscribers, who took part in a reader survey earlier in the year. It is pleasing that you find the magazine balanced and informative. The most popular focus for articles is on individual species. I think many readers will find the account of a Dormouse project in north Wales as fascinating as I did, and be moved by the intimacy of a householder and 'his' house martins.

The most popular request for a new element in the magazine was for a letters page. Perhaps because we haven't featured letters in the past, I have had very few letters with which to start a letters page. Is there something you would like to get off your chest, or something in the magazine you feel moved to respond to? If so, please write to me, and give me the material with which to start a letters page!

One of our aims is to stimulate debate, so an element of controversy is a useful part of the editorial mix. I was therefore disappointed that an official pulled an article on scallops due for publication in the edition, presumably on the grounds that politicians might be angry with an organisation which employed someone who suggested that scallop-dredging was harmful. While I appreciate the sensitivity of the subject – there are livelihoods at stake – I do not think that this kind of self-censorship serves the organisation concerned or the political process well. It certainly doesn't benefit readers – or my hopes for a letters page!

John Markham/RSPB

House martin

To counteract the danger of blandness, I am pleased to include an article in praise of badgers, as well as a polemic against the rise of fences in the uplands. Both should further informed debate, without encouraging the polarisation of views.

Next year *Natur Cymru* will be ten years old, and, assisted by the reader survey, we are planning some new features in the magazine to mark our anniversary. A modest price rise will be introduced with the winter edition, with which we hope to strengthen and improve the magazine.

James Robertson

All photos: Rhian Hughes

Dormice
don't read books!

It turns out that hazel coppice is not the only habitat favoured by dormice; just that this is where humans find them most easily. This and a number of other dormouse secrets have been uncovered thanks to some very neat research and lots of volunteer effort. RHIAN HUGHES, SARAH BIRD, SUE TATMAN and PHILL WATTS tell the story.

Until 1992 it was assumed that the Hazel or Common Dormouse *Muscardinus avellanarius* was not present in north Wales. Many people I have spoken to had found 'interesting' nests before then, but automatically dismissed them as being built by wrens. Thanks to Iolo Lloyd, Forestry Commission Wales, nests found during a pied flycatcher survey revealed the truth about dormouse presence in north Wales. From recent studies of 'our' wild dormice, the one fact we can be certain of is: dormice do not read the books!

Since 2007 the amount of work on dormice in north Wales has increased significantly. Here are some of the activities and findings so far…

Partnership working

Amongst the benefits of working with a charismatic and endangered species like the dormouse is the way it brings disparate organisations together. This, in turn, increases the expertise, volunteers and funding

available for research and conservation. Much dormouse research in north-west England and north Wales since 2005 has been undertaken by the North West Dormouse Partnership, consisting of: Chester Zoo, North Wales Wildlife Trust, Cheshire Wildlife Trust, Denbighshire County Council, Countryside Council for Wales, Forestry Commission Wales, Natural England and the University of Liverpool. Most of the work of this partnership has focused on dormice at Bontuchel near Ruthin, referred to in this article by its proper name Coed Fron Wyllt, and the reintroduced population in the Wych Valley on the Cheshire/Wrexham border.

In 2007 a new North Wales Wildlife Trust (NWWT) initiative extended work on the dormice into the area around Coed Fron Wyllt (which has one of the highest dormouse densities in the UK) and installed dormouse nest boxes at sites in the Conwy Valley. As Dormouse Officer at NWWT, I (Rhian) have been monitoring dormouse sites across north Wales for the last few years. This has included investigating potential new dormouse areas, working with landowners and volunteers, and making hundreds of nest boxes for installation in woodland where the presence of dormice is suspected.

Visit Coed Fron Wyllt or the Wych valley during one of the four survey sessions each year, and you might wonder what was going on. At each session a group of around 20 keen volunteers and a 'vet team' spread out through the woodland, braving waist-height bramble, and enduring biting insects! Painful as it may be, the dormice are worth it.

Which dormouse?

Thanks to Chester Zoo funding and veterinary expertise, each dormouse we find in the main study sites, at Coed Fron Wyllt and Wych, is micro-chipped. This means we can identify individuals if we find them again, and enables us to understand their behaviour better. For example we can calculate how long our dormice are living, how far they travel, whether pairs stay together from year to year, and if they show loyalty to particular nest boxes.

Between May 2005 and May 2010 we have marked a total of 811 dormice at the two sites. Of those animals 32% have been recaptured at least once, and 15% have been found more often than that.

Our most well known dormouse is a female who was first captured and micro-chipped at Coed Fron Wyllt in July 2006 as a juvenile. Since then we have seen her nine times, and know that she bred in 2009 and may also have had young in 2007.

Our longest lived animals are also females from Coed Fron Wyllt, who were both marked in June 2005 and last seen in 2009. As they were mature adults when first captured in 2005, we can confidently assume that they were born in 2004 or

earlier, indicating that they are at least five years old. Other studies have shown wild dormice have varying life spans in different regions. In Lithuania six-year olds have been recorded occasionally; in Britain few animals have been shown to have survived for more than five years, and three to four years is more common in central Europe.

Our study is just reaching the 6th year and we are really hoping to see some of our 'old friends' again! Other studies have found that males tend to live longer than females, so it could be that our dormice are different in this aspect too. Our studies have also shown that juvenile dormice move greater distances in their first year than adults do, supporting other evidence for a dispersal phase in the first year.

Dormouse Family Scandal!

Whenever dormice are encountered by partnership members across north Wales, samples are collected for DNA fingerprinting; this is done by taking a hair sample, or an oral swab. To get good DNA from hair samples, hair follicles have to be collected and this is best achieved by 'peeling' a pinch of hair from the hind leg area. Vets assure us this process looks worse than it feels and the animals rarely even flinch. Dormice don't seem to mind chewing on tiny oral swabs either.

Since 2005 DNA samples have been processed by Darlina Md. Maim from Penang, Malaysia as part of a PhD project supervised by Dr Phill Watts at the University of Liverpool. This research has shown that most litters of baby dormice have more than one father; it was previously assumed that litter siblings all had the same father. Clearly female dormice are quite promiscuous! DNA fingerprinting also helped explain an interesting instance where two females were found occupying the same nest box, with one litter of babies – it revealed that the females were sisters.

Research at the University of Liverpool also uses DNA methods to investigate dispersal of dormice in north Wales, especially those surrounding Coed Fron Wyllt. It appears that dormice can spread quite far in large patches of habitat, such as Coed Fron Wyllt, but rarely move into neighbouring areas that are separated by farmland. Further monitoring will reveal the impact of hedgerow maintenance in facilitating dispersal.

Habitats

As many of you may have read in a previous article about Jack Grasse in Meirionnydd (*Natur Cymru* No 1), some dormice are found in conifer woodlands. This is confirmed by evidence elsewhere in north Wales too, challenging traditional wisdom which states dormice need coppiced hazel woodlands. The fact is that woodlands with hazel understoreys are the easiest places to find evidence of dormice, but the animals are now being found in more and more habitats in the UK.

Extensive surveys in Dorset have found dormice in gorse and coastal blackthorn scrub, oak woodlands, hedgerows and conifer plantations. Clearly we need to be open-minded when looking for these elusive animals. Preliminary vegetation studies at Coed Fron Wyllt indicate that plant species diversity is important for dormice, providing plenty of options

for food, nest sites and nest materials. Areas with a well-developed under-storey and mixed tree species seem to be favoured.

Canopy boxes

After speaking to Jack Grasse, and visiting his dormouse sites near Corris to see his high canopy nest boxes, it was decided to try something similar. Canopy boxes are made out of drain pipe and have a door mechanism which can be closed from the ground when the box is located about 10m up a tree. Forestry Commission tree climbers put the boxes up and also help with monitoring.

At Coed Fron Wyllt 20 boxes were erected in close proximity to the low-level nest boxes already in place. The boxes were used by the time they were first checked (November 08); when checked last October there was a high rate of occupancy, eight boxes being occupied by a total of 12 dormice, of which only two had previously been micro-chipped. We have now found dormice using these high boxes in two of the three sites where they have been installed.

New records

During the project 'Dormouse Postcards' were sent out to postcode areas in close proximity to dormouse sites or potential sites, to raise awareness and obtain any new records. Many phone calls were received and numerous sites now need investigating. Keep looking please.... so we can start to write the book on Welsh dormice!

***Rhian Hughes** is Dormouse Project Officer, North Wales Wildlife Trust; **Sarah Bird** is Biodiversity Officer, Chester Zoo; **Sue Tatman** is Dormouse Project Officer, Cheshire Wildlife Trust; and **Dr Phill Watts** is a Senior Lecturer in the School of Biological Sciences, University of Liverpool.*

Dysgu mwy am Bathewod

Ers 2005 mae partneriaeth eang o fudiadau wedi darganfod llawer am bathewod yng ngogledd Cymru drwy osod micro-sglodion ynddynt, cynnal profion DNA a thrwy osod a monitro blychau nythu.

Dysgwyd bod benywod o Goed Fron Wyllt, un o'r prif safleoedd astudio, yn bum mlwydd oed, o leiaf, ac efallai'n byw'n hirach na'r gwrywod - sy'n wahanol i ganlyniadau astudiaethau eraill. Gwelwyd bod pathewod ifanc yn chwalu beth bellter yn ystod eu blwyddyn gyntaf. Dangosodd profion DNA y gall fod mwy nag un tad gan nythaid o bathewod bach a chafwyd enghraifft hefyd o ddwy chwaer yn magu un nythaid.

Profodd y gwaith bod rhai pathewod yn byw mewn coedwigoedd conwydd – yn wir mae arolygon ledled Prydain yn eu darganfod bellach mewn cynefinoedd amrywiol iawn - yn cynnwys drysni eithin a drain duon ar arfordir Dorest. Dangosodd astudiaethau gogledd Cymru bod amrywiaeth planhigion yn bwysig iddynt – gyda digonedd o fwyd, llecynnau nythu a deunydd nythu. Coedwig gymysg gydag is-haen drwchus sydd orau. Er y gall pathewod ymledu'n bell mewn darnau o gynefin addas, gall presenoldeb tir amaeth rwystro'u symudiad.

Gosodwyd cannoedd o focsys nythu yn Nyffryn Conwy a chafwyd cryn lwyddiant hefyd wrth osod blychau a wnaed o biben draenio yn y canopi, tebyg i rai ardal Corris.

Inspired by Nature competition runner-up

Taking offence

John Farrar

Living and working in Snowdonia as a mountain guide, nothing has upset me more over the last 35 years than the proliferation of fencing high in the mountains. Just as the Right to Roam has become a reality in law, the space in which we can roam has been circumscribed as never before. A walk in the hills, more often than not, is a trudge from stile to stile along a fence-line. For hundreds, if not thousands, of years the hills of Wales were grazed by sheep, goats and cattle, controlled by shepherds and their dogs. These hills were not wilderness – enclosure walls, sheep pens, ancient settlements and Bronze Age burial cairns attest to that. But in the 1950s and 60s they still retained a wildness which no longer exists thanks to agricultural roads, quad-bikes and, above all, fences.

Why all these fences should have become necessary is to do with convenience at gathering times and the stocking requirements of different subsidies, not to mention a grant system that can be manipulated to make a tidy profit. From a farmer's point of view, fencing is an accepted way of managing stock, so why not extend it further up the mountainside if the money is there to pay for it? Besides, he has every right to do what he likes with his land.

I do not agree. Leaving aside the question of whether any man can 'own' a mountain, we, the tax-paying public have a stake in how open land, or access land, is treated. Fences in the uplands strike at the heart of what mountains have to offer, besides grazing, undermining what Harold Drasdo once called "those two ancient, anarchic, subversive values – Beauty and Freedom." A key phrase in the 1949 Act was that National Parks should "preserve and enhance the natural beauty of the landscape." The historian, G M Trevelyan, one of the founders of the YHA and a prime mover in the campaign for National Parks in this country, wrote "By the side of religion, by the side of science, by the side of poetry and art, stands natural Beauty, not a rival to these, but as the common inspirer and nourisher of them all, and with a secret of her own beside." Rachel Carson, American scientist and conservationist, put it even more eloquently: "Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts".

But what is natural beauty? Can it be defined when, notoriously, "Beauty is in the eye of the beholder", when upbringing, preoccupation or mood all play a part in determining whether we notice something, be it a boulder or a mountain, let alone are moved by it? Yet, in terms of landscape, most people would agree, I think, that beauty has something to do with harmony, with things fitting, being all of a piece.

Harmony can relate to colours, shapes, materials, sounds. Bright orange anoraks or tents disturb harmony in the hills temporarily, as can the deafening violence of low-flying jets or the more insistent pounding of helicopters. A fence disturbs it for twenty to thirty years at least. It is not so much that fences are man-made or even that wire is an unnatural material, as that they run in straight lines never found in nature and when they are barbed, or worse still, electrified, they convey a hostile, aggressive message, not just to sheep. In short, a fence is an ugly, by no means essential, artefact imposed arbitrarily on the landscape.

John Farrar

Yet, nowadays, natural beauty is seen as an irrelevance by decision-makers. Can we afford to be concerned about it in a recession, the Chairman of a recent conference *The Future of the Uplands* wondered, and it went unchallenged. Clough Williams-Ellis must have turned in his grave... In our perfectly valid concern for conservation, recreation, cultural heritage and the wellbeing of local communities, we have lost sight of the original, fundamental purpose of National Parks. A political inconvenience, it has been swept under the carpet, out of sight out of mind.

Freedom is the other crucial value in our relationship with the great outdoors. Our everyday lives are constrained not only by the need to earn a living and maybe support a family, but equally by routine and convention. Where we can go, what we can do, when we can do it, even what we can wear are all dictated to us much of the time. We have remarkably little real choice in how we live from day to day. But, in the words of the Manchester Rambler, we may be wage slaves from Monday to Saturday but we can be free men on Sunday, and the moors and the mountains beckon now as much as in the 1930s.

John Farrar

Equally important is a need for direct contact with Nature. Only in the last 200 years have most people in the West come to lead lives so divorced from the natural world and the elements of earth, air, sun and water. There is a widespread need for places where there are few other people, an absence of manmade infrastructure and noise, and where we can, quite simply, re-connect with Nature, Mother Earth, Gaia, call her what you will.

Yet now, in Snowdonia, ubiquitous fences are not only unsightly intrusions into wild landscapes but also a denial of that intangible but real sense of freedom that comes with wide open spaces. Beauty and freedom, both of them diminished and diminishing, in a National Park created with such idealism less than 60 years ago.

Fencing with wire became widespread in the 20th century and only in the last 30 years has it been extended above the ffridd wall onto the mountain. We do not have to accept that it is here to stay. Posts and wire can be removed as they become derelict. Once down, I would love to see a moratorium on all fencing above 600metres. Perhaps we could extend the moratorium to quad bikes and ATVs. I would not take issue with fencing for a specific purpose, like allowing the montane heath on Pen yr Ole Wen to recover from decades of over-grazing, for instance. But, in principle, let us allow high land to be wild land once more and treat the mountains with respect.

Rob Collister

John Harold

Seicoleg Ffwng a Madarch

Byd rhyfeddol yw byd y madarch. Anwybodaeth ac ofn, yn bennaf, sydd yn nodweddu perthynas pobl Prydain â nhw, a hynny efallai am nifer o resymau hanesyddol. Ond mae CYNAN JONES wedi magu perthynas agos iawn â madarch ac wedi meistroli techneg, yn seiliedig ar dwyll, sy'n golygu y gall cynaeafu cnwd o fadarch ecsotig drwy'r flwyddyn yn Nantmor, ger Beddgelert.

Sawl gwaith yr ydym wedi clywed unigolion, yn enwedig pobl ifanc, yn dweud "does neb yn fy nallt i" pan y maent yn teimlo iddynt gael rhyw gam neu'i gilydd; ac fe'i clywn yn amlach na pheidio pan y bydd yr unigolion un ai'n ymddwyn yn wahanol i'r "norm " neu'n dal syniadau gwahanol i weddill cymdeithas. Rhyw deimlad felly rwyf i yn ei gael wrth ystyried teyrnas y ffyngau a'r madarch yn ein byd. Bron na'u clywaf yn cwyno am y diffyg sylw y maent yn ei gael, ac yn protestio am y rhagfarnau cyson y maent yn eu hwynebu gan bobl!!

Felly, er tegwch i'r ffwng a'r madarch, fel pob problem gymdeithasol, rhaid ceisio dallt pam fod rhywun neu (yn yr achos hwn) rhywbeth yn teimlo fel hyn, ac yn aml iawn rhaid tyrchu i hanes y gwrthrych ei hun yn ogystal â'r rhai sydd yn dal y rhagfarnau hyn er mwyn mynd at wraidd pethau.

Richard Becker

Amanita'r pryfed *Amanita muscaria* Fly agaric

A dyma ni'n agor y drws ar faes seicoleg ffwng a madarch a'u perthynas â phobl.

Y cefndir seicolegol

Mae ffwng a madarch (nid oes gwahaniaeth gwyddonol rhwng y ddau, a dweud y gwir) wedi bod yn rhan o fywydau pobl ar draws y byd ers miloedd o flynyddoedd gyda rhai diwylliannau yn rhoi mwy o lawer o statws a pharch iddynt nac eraill. Rhai pobl yn eu diystyru'n llwyr, neu hyd yn oed yn eu hofni tra bod eraill yn eu parchu â pharch aruchel gan roi statws crefyddol i rai mathau o fadarch - yn enwedig y rhai â'r gallu i newid canfyddiad pobl o'u hamgylchedd neu newid agweddau meddyliol.

Rhwng y ddwy eithaf yma y mae ffwng a madarch wedi bod, ac yn parhau i fod yn ffynhonnell bwyd ac yn sail i feddyginiaethau i filiynau o bobl. Mae hyn yn wir am y rhan helaeth o gyfandir Ewrop er enghraifft, ond nid i boblogaeth Gwledydd Prydain sydd yn unigryw yn eu hanwybodaeth a'u hofn o'r byd madarchol.

Cyn dilyn y trywydd yma, mae'n bwysig dadansoddi cyflwr seicolegol y ffwng a'r madarch. Hyd yn gymharol ddiweddar (o fewn y ganrif ddiwethaf), nid oedd y byd gwyddonol yn gwybod sut i ddosrannu ffyngau i gategorïau traddodiadol byd natur. Roedd pawb yn gytûn nad anifeiliaid oeddynt, ond ai planhigion oeddynt? Wel na, ddim yn union felly, ac o'r diwedd, wedi ymchwil a thrafodaethau mawr sefydlwyd Teyrnas iddynt eu hunain. Does ryfedd felly fod y pethau bach yn ansicr ohonynt eu hunain felly.

Does dim dwy waith fod yr ansicrwydd hyn wedi cyfrannu at y camddealltwriaethau mawr ynglŷn â ffyngau dros y canrifoedd, nid yn unig o ran eu dosrannu a'u categoreiddio gwyddonol ond yn nhermau eu hadnabod a dallt cylch eu bywydau. Wedi'r cyfan maent yn ymddangos yn sydyn ac yn achlysurol, ffaith sydd wedi creu rhyw feddylfryd hudol a rhithiol o'u hamgylch, heb sôn am eu doniau secotropig a seicodelig.

A beth felly am ein perthynas ni â ffwng ar yr ynysoedd hyn? Gellir ei ddisgrifio mewn dau air - anwybodaeth ac ofn. Beth felly sydd i gyfrif am hyn ? Rwyf wedi trafod hyn droeon gyda thri chyfaill ac awdurdodau madarchlyd; un o'r rhain yw'r naturiaethwr o Blas Tan y Bwlch, Twm Elias, sy'n awdur toreithiog ar bob agwedd o fyd y ffwng, ac arbenigwr ar lên gwerin y madarch ac hefyd ffwng bwytadwy. Patrick Harding yw'r ail gyfaill sydd â diddordeb yn y maes ac yn olaf bum hefyd yn trafod gyda phrif athronydd madarchol Cymru, Richard Edwards a sefydlodd gwmni meithrin a thyfu madarch Humungus Fungus yn Llangadog.

Y farn gyffredinol, a heb gymorth pryd o fadarch hudol y mae'n rhaid dweud, yw bod preswylwyr yr ynysoedd hyn wedi colli'r cof cymunedol a theuluol am fadarch dros gyfnod o ganrifoedd, a hynny

Cylchoedd y tylwyth teg • Fairy ring

oherwydd rhai digwyddiadau hanesyddol sy'n unigryw i Brydain Fawr fel, er enghraifft:

Harri'r VIII fed – torrodd filiynau o goed yn ystod ei deyrnasiad, rhai ar gyfer adeiladu llongau ond y mwyafrif ar gyfer diogelwch personol – nid oedd yn fodlon teithio ar hyn lonydd lle roedd modd i rhywun â'i fryd ar ei lofruddio (ac mi oedd yna lawer) guddio gydag arfau. Felly, torri'r coed o boptu'r ffyrdd oedd ei ateb.

Trwy dorri coed roedd cynefinoedd naturiol rhai ffyngau yn cael eu colli, ac felly roeddent yn prinhau.

Rhaid cofio hefyd bod poblogaeth trefi a dinasoedd yr ynysoedd hyn wedi cynyddu yn aruthrol o'r oesoedd canol ymlaen ac roedd hyn eto yn cyfrannu at ddiflaniad y cynefinoedd .

Y Chwyldro Diwydiannol – un o ganlyniadau'r Chwyldro Diwydiannol oedd symudiad pobl o gefn gwlad i'r trefi a'r dinasoedd newydd. O fewn un genhedlaeth arall byddai pobl wedi colli adnabyddiaeth o'r cynefinoedd a'r cof am fyd natur yn gyffredinol.

Deddfau'r Cau Allan (Inclosure Acts) – rhwng 1750 ac 1860 pasiwyd nifer o ddeddfau a oedd yn atal pobl gyffredin rhag mynd ar dir a oedd cyn hyn yn dir comin. Effeithiodd hyn ar 7 miliwn a mwy o erwau Lloegr yn unig. Nid hwn yw'r lle i drafod gwleidyddiaeth a moesoldeb y dwyn cyfreithiol hwn ond yr effaith, unwaith eto, oedd amddifadu'r boblogaeth rhag mwynhau ardaloedd eang o gefn gwlad, ardaloedd a fyddai'n gynefinoedd i ffwng a madarch.

Chwyldroadau Crefyddol - yn arbennig y chwyldro Protestanaidd a'r pwyslais Piwritanaiddd a ddylanwadodd yn fawr ar feddylfryd a gwleidyddiaeth Ynysoedd Prydain am ganrifoedd. Am nad oedd pobl yn dallt madarch, ac yn eu gweld fel rhywbeth esgymun a dyfai mewn tywyllwch a thamprwydd fe'u cysylltwyd â bydoedd rhithiol a phwerau'r Fall. Wedi'r cyfan onid oedd y tylwyth teg yn dawnsio mewn cylchoedd o fadarch a gwrachod yn eu defnyddio yn eu diodydd dieflig? Onid oedd llawer o bobl hefyd wedi marw ar ôl bwyta rhai madarch (ffaith sy'n hollol wir wrth gwrs!) ac mae'n siŵr fod rhai yn ymwybodol o'r effeithiau seicotropig a ddeilliai o fwyta rhai mathau o fadarch.

Robert Lawson

Roedd hyn oll yn anathema i'r crefyddwyr pybyr, ac yn eu hargyhoeddi fod madarch a ffwng yn bendant yn un o ddyfeisiadau'r Diafol ei hun- ac i'w hosgoi yn gyfangwbl ar boen marwolaeth!

A dyna ni sut y bu i bobl gyffredin nid yn unig golli'r cof cymunedol am werth madarch ond dod i'w hofni a'u casáu, a pham y bu rhaid i'r madarch druan ddioddef y ffasiwn erledigaeth dros y blynyddoedd.

Seicoleg casglu madarch gwyllt

Beth am fynd â'r astudiaeth o seicoleg y ffwng

ymhellach er mwyn cael mwy o lwyddiant wrth gasglu madarch gwyllt? Y gyfrinach, fel y dywed Richard Edwards o Humungus Fungus, yw “mynd i mewn i ben y madarch”, sef dallt cylch eu bywydau a dallt beth sy’n rheoli eu hymddygiad.

Yn gyntaf rhaid gofyn cwestiynau syml, megis pa bryd y mae madarch a ffwng yn ffrwytho (oherwydd y corff ffrwytho rydym yn ei weld wrth gwrs), ac ymhle y maent yn ffrwytho?...

Mae gwahanol fadarch yn ffrwytho ar adegau gwahanol ac mewn llefydd gwahanol, ond maen nhw i gyd yn dilyn patrwm o ymddygiad y gellir ei ddadansoddi. Dyma rai pwyntiau i’ch helpu:

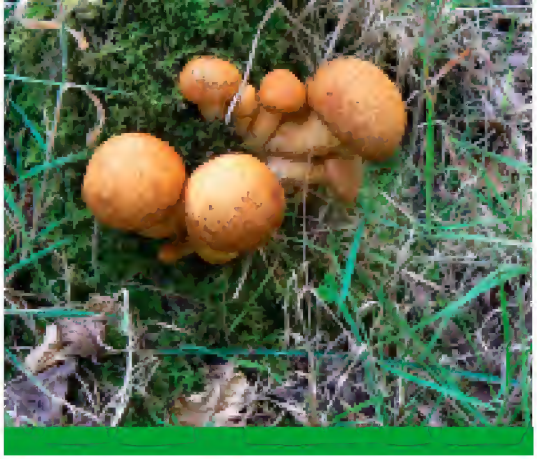
- Pwy yw eu cyfeillion a’u cymdogion? Hynny yw, yn ymyl pwy y maen nhw’n byw? Gall fod yn dir o fath arbennig, neu’n aml iawn coed o fath arbennig gan fod nifer fawr iawn o ffwng ddibynnol ar berthynas gyda choed a phlanhigion eraill (a bacteria a dweud y gwir) er mwyn byw a thyfu. Rhaid adnabod coed yn dda felly os am adnabod a darganfod madarch penodol.
- Pa adeg o’r flwyddyn, neu’n bwysicach, pa dywydd sydd yn eu hysgogi i ffrwytho?

Marwolaeth yw un o brif ofnau popeth byw, ac mae madarch a ffwng yn rhannu’r un ofn. Maen nhw’n ffrwytho, er mwyn sicrhau parhad yr hil, pan y maen nhw’n wynebu marwolaeth. A beth sydd yn creu’r ofn hwn, o safbwynt y madarch? Yn syml iawn, diffyg bwyd neu sioc o rhyw fath.

Beth sydd yn rhoi sioc i’r madarch felly? Fel yn ein hachos ninnau, rhyw newid sydyn yn ein amgylchiadau, ac yn bennaf (o ran y madarch) newid yn y tywydd megis gostyngiad yn y tymheredd, cynnydd yn y lleithder ac hefyd newidiadau yn y goleuni naturiol sydd ar gael, sef newid yn hyd y dydd.

Oherwydd y rhesymau hyn y mae y rhan fwyaf o fadarch yn ffrwytho ar ddiwedd yr haf neu yn yr hydref, cyn i’r tywydd drwg beryglu eu bywydau.

Beth am ddiffyg bwyd ? Ni all ffwng greu eu bwyd eu



~ Mandy Marsh

hunain fel y mae planhigion yn gwneud, felly maen nhw’n byw ar ddeunydd organig a gynhyrchwyd gan anifeiliaid neu blanhigion - er enghraifft gan goed byw neu farw. Pan fydd yr holl “fwyd” wedi ei fwyta rhaid ffrwytho cyn marw.

Yr un rheswm, yn y bôn, sy’n egluro pam fod madarch yn tyfu ar ymyl afon neu ffos, neu wrth ffordd fawr neu glawdd. Maen nhw wedi cyrraedd rhwystr, ac felly’n ffrwytho gan na fydd mwy o fwyd ar gael iddynt.

Seioleg tyfu madarch yn fasnachol - Yr Ardd Fadarch, Nantmor.

Yr un ddealltwriaeth o ymddygiad madarch sy’n sail i’n busnes tyfu madarch egsotig ar gyfer cogyddion. Rhaid i ni fynd i mewn i ben y madarchyn, boed yn Shiitake, Wystrys y Coed neu Fadarch Maes a’u twyllo i feddwl fod yr hydref wedi cyrraedd a thrwy hyn eu cael i ffrwytho. Trwy gychwyn gyda phecyn penodol o’u “bwyd” sef 2kg o flawd llif derw yn bennaf, ac ambell gynhwysyn arall, a chan ddefnyddio cyfuniad o amgylchiadau tyfu – sef cynnes a thywyll ac yna llaith ac oer - mae modd medi madarch ffres bob un dydd o’r flwyddyn.

Efallai y dylwn deimlo yn euog am fynd i fewn i ben madarch gwyllt, a thwyllo’r rhai egsotig i dyfu pob dydd o’r flwyddyn yn Eryri, ond tydwi ddim !! Y mae’r wefr o weld y madarch yn y coed, neu’n llenwi ein hunedau tyfu yn werth yr holl ymdrechion seicolegol ffwngaidd.

*Mae **Cynan Jones** yn tyfu madarch Shiitake, Oyster a Chestnut yn Yr Ardd Fadarch yn Nantmor ger Beddgelert yng nghanol Eryri.*

The Psychology of Fungi and Mushrooms

People often complain about being misunderstood, but what about the world of fungi? I can almost hear them complaining about the lack of attention they get and protesting about the constant prejudices which they face from people!

To understand why fungi are so misunderstood, you must delve into their history and the reasons why people hold these prejudices. This opens the door to the psychology of fungi and mushrooms and their relationship with people.

The psychological background

Fungi have been part of people's lives across the world for thousands of years, with some cultures giving them much more status and respect than others. Some completely disregard them, or even fear them, while others respect them hugely, giving religious status to some types of mushrooms - especially those with the ability to change people's perceptions.

Fungi are a source of food and a basis for medicine for millions of people. This is true for most of Europe, but not Britain, which is unique in its ignorance and fear of the mushroom world.

Until fairly recently (within the last century), the scientific world didn't know how to classify fungi. Everyone agreed they were not animals, but were they plants? Well, not exactly, and after much research and discussion it was finally established that they belonged to a separate Kingdom. It is no wonder that fungi are insecure!

There has also been confusion about their identification and life-cycle. After all, they appear quickly and sporadically, which has created a somewhat magical aura about them, not to mention their psychotropic and psychedelic properties.

Why is our relationship with fungi on these islands characterised by ignorance and fear? I have discussed this many times with three friends who are authorities on mushrooms; one of these is the naturalist from Plas Tan y Bwlch, Twm Elias, who is a prolific author on every aspect of fungi, and an expert on mushroom folklore as well as edible fungi. The second is Patrick Harding who has an interest in the field, and lastly, I have also discussed this with Wales' foremost expert on mushrooms, Richard Edwards, who founded a mushroom growing business, Humungus Fungus, in Llangadog.

The general opinion, and without the aid of magic mushrooms, is that the residents of these islands have lost the community and family memory of mushrooms over the centuries, because of some historical events such as the Industrial Revolution and the advent of the Inclosure Acts. These may have eroded collective community knowledge about how to recognise and use wild mushrooms. The influence of religion may also have caused people to shun this fascinating group of organisms; their association with fairies, their hallucinogenic properties and their ability to kill were surely a sign that they were the work of the Devil himself!

Collecting wild mushrooms

Successful mushroom-gathering requires an understanding of fungus 'psychology'. The appearance of mushrooms is a shock-induced reaction caused by a sudden change in their environ-

John Harold

Ffwng wedi ei drin • Cultivated fungi

ment. It is the fear of death that causes most fungi to fruit in autumn, before the arrival of winter.

Another factor is lack of food. Fungi cannot produce their own food like other plants, so they live on organic materials produced by animals or plants - for example trees, dead or alive. When all the 'food' has been eaten they must fruit before they die. This is essentially why mushrooms grow near rivers or dykes, or near roads or hedgerows. They have reached a barrier, and therefore fruit as there will be no more food available to them.

Gaynor Ainscough

Capiau cwyr • Waxcaps

Growing mushrooms -
The Mushroom Garden, Nantmor.

The same understanding of mushroom behaviour is the basis for our exotic mushroom growing business for chefs. We must enter the mind of the mushroom, be they Shiitake, Oyster mushrooms or Field mushrooms and deceive them into thinking that autumn has arrived so that they fruit. By beginning with a specific package of their 'food' (mainly oak sawdust), and some other ingredients, and using a mixture of growing environments - warm and dark before becoming damp and cold - fresh mushrooms can be harvested every day of the year.

Perhaps I should feel guilty about entering the mind of a wild mushroom, and deceiving the exotic ones to grow every day of the year in Snowdonia, but I don't! The thrill of seeing mushrooms on the trees, or filling our growing units, is worth all the psychological effort to understand the world of mushrooms.

Cynan Jones , The Mushroom Garden, 2010
Cynan Jones grows Shiitake, Oyster and Chestnut mushrooms at The Mushroom Garden at Nantmor near Beddgelert in the heart of Snowdonia.

All photos: Michael D. Smith

Encounter with a badger

The only badgers most people see are ones lying dead at the side of the road and for many farmers a good badger is a dead one. For others, badgers are a much maligned denizen of the Welsh countryside. LINDA AULD looks forward to the thrill of seeing a live badger.

Earlier in the morning I'd been lucky enough to see a fox coming out of my horse's field shelter. As I pushed a wheelbarrow past the shelter the fox trotted out, gave me a sideways glance and then disappeared across the fields. Then my luck continued – as I emptied the wheelbarrow on the muck heap a couple of snipe flew up, giving their warning call and flying away fast and low.

A few nights ago I'd put out dog food mixed with peanuts and some leftover fish on the patio. It was a full moon and I got up in the middle of the night and looked out – the food was still there. In the morning it was still uneaten. I was surprised even the fox hadn't found it. The next night I put the same food out again. Before I went to bed I peeped through the patio doors and saw a striped face. They were the wrong sort of stripes and the face was flat. A huge pair of staring eyes met mine – it was a tabby cat from a neighbouring farm and all it left was the peanuts. The following night I made some American-style peanut butter and jam sandwiches and added most of an uneaten heavy fruit cake (I had seen too late that the flour from the back of the cupboard would have been 'Best before January 2003').

Later I went to draw the curtains and froze. A long black and white humbug head was within a couple of feet of me. He was broad and chunky and had white tips to his ears. I say 'he' as the females are narrower. His claws were big and long – powerful tools for digging, scratching and raking up bedding. The fur on his body was thick, coarse and grey and reminded me of the shaving brush my grandad had used with a leather strap and cut-throat razor. Only the glass separated his secret nocturnal world from mine and I felt I was intruding on his privacy. Time seemed to stop as I watched him sniffing and snuffling and gobbling up the sandwiches and cake. Then my German Shepherd Monty lumbered into the room, and seeing something moving outside he gave an almighty 'woof!'. The badger tensed up and with the low down power of a Harley Davidson motorbike ran fast across the lawn. I just saw a white-tipped stumpy tail as the bear-like body went through a gap under the fence.

There isn't a sett very near me on the edge of Myndd Bach so I wondered why this badger was here. They live in close social communities, but if disturbed by hunting or culling they move out of their usual territory and in this way infected animals can further spread Bovine Tuberculosis (bTB). The Eurasian common badger *Meles meles* belongs to the family Mustelidae which includes the pine marten, stoat, otter, weasel and ferret. Badgers are not fussy eaters (as proved by the disappearance of my fruit cake) and they usually eat earthworms (hundreds a day), insects, berries and small rodents. The distinct black and white stripe may have given them their name as it looks like a badge. 'Badger' could also be derived from the French word *bêcheur* meaning digger, and if you speak broad Norfolk you'd call it a badget.

Badgers are both loved and hated in the UK. In Kenneth Grahame's *The Wind in the Willows* the animals are rather like people but take on some of the characteristics of the animals they represent. Mr. Badger is gruff, has a large cosy home and bravely helps drive away the Wild Wooders from Toad Hall. Fascination for badgers is international – in Japanese folklore the badger is *mujina*, a shapeshifter and deceiver of humans, like *tanuki* the fox. 'That most ancient Briton of English beasts' as described by Edward Thomas in his poem *The Combe* is a tough and enduring species that has survived centuries of persecution – there's a long list including shooting, gassing, lamping, digging out, being eaten, poisoning, snaring and loss of habitat. They have some protection under The Protection of Badgers Act 1992 but this is often ignored. John Clare's poem *Badger* describes the slow death of a badger which fights on until it 'crackles, groans, and dies' for the 'sport' of badger baiting which is still practised today.

The word on everyone's lips now is of course culling, a euphemism (like humane dispatch or ethnic cleansing) for the killing carried out by the government for more than 30 years. Badgers are an enduring species, but are now almost extinct in parts of Ireland where culling has been extensive. Rumour has it that some

of the dead badgers we see by the roadside are not roadkills but have been dumped there, so perhaps Arthur Boyt (the man who eats badgers[1]) should check to make sure they've been run over rather than poisoned. Some farmers and gamekeepers dislike badgers because they dig up their fields and will take unprotected chickens and eggs and a dead or weak lamb if the ewe doesn't see them off. They are not popular with gardeners either, if they dig up their prize blooms, but there are ways to discourage this and live alongside them[2], and won't it be a sad world if the only animals humans allow to survive are the ones we find cute, useful or edible?

In some parts of the UK bTB is being tackled through vaccination programmes and other methods as well as better support for farmers with affected cattle. On reading the Report of the Independent Scientific Group (ISG) and its concluding recommendations against culling[3], I wonder why the Welsh Assembly has not followed this advice. Can we have any faith in an authority that makes decisions without listening to experts? The ISG's advice is not based on sentimentality (unfortunately thousands of badgers were culled in trials before they concluded that culling was not effective) so neither the ISG scientists nor other scientists[4] can be accused of being sentimental townies or animal rights activists. The Welsh Assembly has been accused of planning the cull in the area north of Pembrokeshire to secure farmers' votes: European farming laws mean that if a herd has an infected cow then none of the herd can be sold in Europe. While badgers are being blamed the necessary and effective controls are not being put into action and bTB is continuing to spread. Some farmers are actually against culling and I've heard that others are afraid to speak out because of peer pressure and the belief that farmers must form a united front. In Scotland bTB has been controlled via cattle regulations and the EU has now accepted Scotland as bTB free, so why hasn't the UK followed Scotland's example? In the UK Defra is sponsoring research to find a cattle vaccine that doesn't interfere with the TB test, but they say this may take them 10-15 years.

Bovine TB is a contagious bacterial disease and most mammals, not just badgers, can be infected. It spreads through feed and watering sites contaminated with saliva or other discharges such as urine and faeces; watering places shared with deer, feral swine and other animals; or through unpasteurized milk from infected cows. Intensive farming, enclosed areas (such as barns with poor ventilation and heaps of manure), the activities of dairy farming, unpasteurized milk fed to calves and the way slurry is managed, are all spreading bTB. The main way it spreads is through cattle themselves, as with Foot and Mouth. It is more likely that badgers will be infected by cattle than the other way round, for instance when badgers are looking for worms and beetles in cow pats – in fact, about 40 years ago it was discovered that cattle had first infected badgers rather than badgers first infecting cattle. The Foot and Mouth epidemic didn't help either - TB tests were suspended, many cattle were kept indoors, and farmers whose cattle were culled bought replacements from elsewhere which in many cases hadn't been tested for TB.

The Badger Trust[5] has had to spend six-figure money on legal action and other costs to stop the cull, and their success is a huge stepping stone in wildlife protection. Some of my faith in official decision-making processes was restored in July when the High Court found the proposed cull to be unlawful. When the Welsh Assembly appealed, the Court of Appeal said it had unlawfully misinterpreted the Animal Health Act 1981.

An injectable TB vaccine for badgers has just been licensed by Defra and this will be a long term measure which will protect healthy badgers. Unfortunately it won't help badgers already infected. Meanwhile, the Badger Trust, Brian May and many other people are succeeding in stopping the cull, and I for one will continue to put out food and hope to see another striped head when I look through my patio window.

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5 The Badger Trust: www.nfbg.org.uk

Fungi, fear and foodstuff

Mae'r mochyn daear yn destun cariad a chasineb ym Mhrydain. Cafodd ei erlid ers canrifoedd – ac ar waethaf Deddf Gwarchod Moch Daear 1992 mae hyn yn dal i ddigwydd. Twyllwr dynion yw'r mochyn daear mewn llên gwerin Siapaneaidd, ond caiff ei bortreadu'n fwy cynnes mewn llyfrau fel 'Wind in the Willows'. Mae rhai wrth eu bodd yn denu'r creadur at eu tai gyda danteithion, tra bod eraill yn eu ffieiddio am dyrchu wyneb caeau, dwyn ieir a chodi blodau gardd!

Llwyddodd oroesi ar waethaf yr erledigaeth. Y bygythiad diweddaraf yw bwriad y Llywodraeth yng Nghymru i ladd moch daear yng ngogledd sir Benfro oherwydd y cysylltiad gyda diciâu gwartheg. Bwriad sy'n mynd yn groes i argymhelliad Grŵp Gwyddonol Annibynnol i beidio dilyn y trywydd hwn am nad yw'n ffordd effeithiol o atal lledaeniad diciâu.

Mae sawl factor yn cyfrannu at ledaeniad diciâu gwartheg, fel yr arfer o gadw gyrroedd dan do a'r ffordd y rheolir slyri. Yn yr Alban mae rheoliadau gwartheg wedi llwyddo rheoli'r clefyd. Derbynnir bellach gan Ewrop bod yr Alban yn rhydd rhag diciâu gwartheg. Pam felly nad yw Cymru'n dilyn ei hesiampl? Fe gymer 10-15 mlynedd i ddatblygu brechiad ar gyfer gwartheg. Ond mae Defra newydd drwyddedu brechiad diciâu ar gyfer moch daear a fydd, o leiaf, yn helpu gwarchod moch daear iach yn y tymor hir.

Inspired by Nature competition runner-up

Swallows and Martins

Tom Marshall/RSPB

House martin

This is a story of immigrants with indomitable spirits, travelling thousands of miles without passports and overcoming enormous obstacles. Some will perish on route but most will survive to reach their destination. Some are made welcome; many are abused, rejected, turned away. Those that survive these ordeals make homes and breed, with an urgency that denies the strains that this will impose upon the parents. They are a resilient and resourceful tribe and their numbers increase rapidly - older siblings assisting in feeding the new arrivals. For a while life is good, food is abundant, but then things begin to change. They gather together in huge numbers chattering incessantly, complaining about the weather. Eventually conditions become so bad that they are forced to leave. Babies too weak to make the journey are abandoned to die of starvation.

No social workers will intervene. No newspaper will headline their fate. No questions will be asked in the House. Surprisingly, even their supporters accept their fate – if you're a *hirondelle* then this is the way it will be!

These are Sub-Saharan Africans; not economic migrants but the swallows, house martins and swifts that arrive on our shores each spring. You don't have to be a bird-watcher to be intrigued by their story. Their existence is closely linked to ours. They nest on or even in our homes, having abandoned original natural sites at some stage in their evolution. They are similar yet distinctive in appearance; tuneless yet pleasant in voice. They are superb flyers, fast and manoeuvrable, effective hunters and evasive prey. Their food is small; flies, midges and other winged insects, but gathered in huge numbers – and disposed of in similar quantities. This is natural history but don't tell anyone. It's educational but don't tell them that either. Let me entertain you first with a story about your neighbours. Whether you're an Eastender or you live in Coronation Street you'll probably have met these characters but let's get behind the scenes and dig up some dirt. Here's mud in your eye!

I shared my house in West Wales with house martins; they pre-dated and outnumbered me. When I first arrived there were only six nests, plastered beneath the ample eaves of the detached house, overlooking fields peppered with friesans, all the way down to the winding stream. The previous owner had hung ribbons to deter them and neighbours hosed away their early attempts at foundations. The possession of binoculars must have identified me as a soft touch.

Numbers increased year upon year, the prime sites on the side of the house overlooking the valley quickly taken; they spread all around the eaves. I erected trays to catch their droppings, calculating a balance between their desired entry trajectory and protection for my windowsills. I negotiated a ceasefire over a spot allocated for a conservatory so they doubled their plots on the remaining prime sites. On a summer evening the skies above the valley resembled the Battle of Britain as they swooped and flickered in an endless chase. On occasions a local peregrine would give pursuit, but I never saw it catch one, even when it took to perching on my guano trays and lurching at emerging youngsters. With assistance from an expert I took to recording egg production, perched on top of a ladder, using a dental mirror to peer inside the nests; but this close proximity had its pitfalls. I sported a labour-saving beard at the time and shortly after one nest recording session I had a dental appointment. Under the powerful examination light my dentist (a family friend) observed something moving in my beard. Resisting the temptation to use his drill, on my request, he recovered it with forceps!

Flatflies are parasites of nests and feathers and as the first part of their name suggests, somewhat dimensionally challenged. They are more accurately known as bird lice and only fly as passengers. The children thought it hilarious and generously shared their school issue nit combs!

The swallows were not going to miss out on the field parties either. There was plenty of mud and grass to go around and all it needed was an opening – literally – and they were ensconced in the garage and the shed. One even reccied the greenhouse although it was soon transparent that it wasn't a good idea (sorry!). They almost demanded head protection and commanded their air space with awe-inspiring agility. To gain advantage over the more numerous martins they took to low-level food gathering along with dive bombing the cat who once caught one with one paw, but was so surprised that she ran away as it struggled to relaunch itself.

Mark Thomas/RSPB
Swift

Chris Gomersall/RSPB
Swallow

The swifts never actually took up residency, they just screamed in from the nearby church, scything through the skies like aerial cavalry. They always appeared to be in a collective hurry, chiding each other for flying too close or too fast, but quick to home in on a mating swarm of ants.

Each year we would mark our calendars with their arrivals, welcoming the advance party scouts as harbingers of spring, a week or two between the first sightings and the early nesters. In the autumn we would watch as they gathered on telephone wires, as if waiting for the word, if not the wind and the weather.

One day they would be there in their thousands; the next gone, the skies visually silent. It is difficult to imagine the hazards and adventures they faced undertaking this enormous journey back to Africa, many for the first time.

I sold this *hirondelle* heaven as our family changed and moved further west into the Preseli Hills. On the first day of May as we moved into our new house I noted a house martin testing the eaves.

"Oh but they never stay," insisted the departing couple. "We even put up an artificial nest, but they never occupied it."

Just you wait I thought – and they didn't disappoint me.

Stewart Roberts

Dave Goulson

Bumblebees on the Pembrokeshire coast

Shrill carder bee *Bombus sylvarum*

***PIPPA RAYNER,** Conservation Officer for the Bumblebee Conservation Trust, is currently working throughout England and Wales to conserve bumblebees by providing wildflower habitats. Her main focus is preventing the national extinction of the shrill carder bee* **Bombus sylvarum**, *a very rare bumblebee which has three of its six remaining UK populations in south Wales. Since starting in post last summer she has been raising awareness of the plight of this and other rare bumblebees, as well as setting up new projects to help provide the habitats that bumblebees desperately need.*

Earlier this year many of you may have heard about the opportunity to vote for a new project to help bumblebees in Pembrokeshire. The Pembrokeshire Bumblebee Path Project, put forward by the Bumblebee Conservation Trust (BBCT), was up against five other worthwhile projects to win €30,000 of funding from the EOG Association for Conservation. The competition involved a public online vote on the 'Live for the Outdoors' website and received lots of interest from the public around the UK and beyond. After two weeks, lots of nail-biting and over 18,000 votes, everyone at BBCT was overjoyed to find out that, despite being up against such strong competition, we had won!

BBCT's project involves creating eye-catching wildflower-rich habitats that will attract and support rare bumblebees surrounding a new ten kilometre path around Castlemartin Range, in Pembrokeshire. Receiving this funding has meant that BBCT, working in partnership with the Pembrokeshire Coast National Park Authority (PCNPA), Countryside Council for Wales (CCW) and the Ministry of Defence (MoD), has a

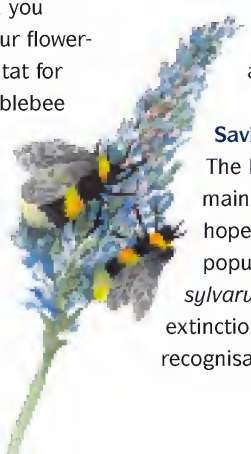
Pippa Rayner

Castlemartin

fantastic opportunity to create a bumblebee paradise along the Pembrokeshire coast.

Bumblebees need our help

Why are we going to so much trouble? The widespread loss of flower-rich habitats, due mainly to intensification of farming practices and changes in land use, has had a truly shocking impact on bumblebee populations. Almost all 24 UK bumblebee species are now thought to be in decline, with ten species in significant decline, and two species already nationally extinct. However, when you consider that we have lost over 97% of our flower-rich grasslands - the most important habitat for bumblebees - the significant drop in bumblebee populations doesn't seem so surprising. Whilst this makes the future for bumblebees sound pretty bleak, the great news is that we can turn everything around if we act now. One of BBCT's main aims is to increase the availability and quality of habitats in order to stop these declines and help bring the buzz back for good.



This isn't just conservation of biodiversity: bumblebees have an important role to play in supporting agriculture and our economy, as they are vital pollinators for many crops. Some crops, such as tomatoes, are only pollinated by bumblebees as they require sonication (buzz pollination). It is thought that, together with honey bees, bumblebees deliver most of the €14.2bn which Europe's insect pollinators contribute to the economy. Bumblebees are also important pollinators for the majority of our wildflowers and are thought to be the sole pollinators of many plants, so continued decline of bumblebees will have huge impacts for both agriculture and conservation alike.

Saving the bumble with the high pitched buzz!

The Pembrokeshire Bumblebee Path Project's main focus is to provide habitat to support, and hopefully boost, one of the few remaining populations of the Shrill Carder Bee *Bombus sylvarum*, which is thought to be on the verge of extinction in the UK. This beautiful bee, instantly recognisable by its high pitched buzz, has

Pippa Raynor

dramatically declined and can now only be found in six isolated populations in south England and Wales. Castlemartin Range supports one of the most important remaining populations and protection of this is vital for the Shrill Carder Bee's long term survival in the UK. The Range is so valuable to bumblebees because it provides a large area of grassland that has, unlike the surrounding landscape, escaped agricultural intensification due to its use and management by the MOD since 1939. This has resulted in a large area of flower-rich habitat that supports 19 species of bumblebee, including three other UK BAP species (the Red-shanked Carder Bee *B. ruderarius*, Brown-banded Carder Bee *B. humilis* and Moss Carder Bee *B. muscorum*) as well as a wealth of other wildlife.

BBCT

Red-shanked carder bee *B. ruderarius*

It's all about good habitat!

The project aims to create wildflower-rich habitats in areas alongside the new path, which will be managed sensitively for bumblebees by allowing the vegetation to grow and flower over the spring and summer months. The vegetation will be managed to encourage bumblebee favourites such as red clover *Trifolium pratense*, yellow rattle *Rhinanthus minor*, red bartsia *Odontites vernus*, bird's-foot-trefoil *Lotus corniculatus*, self-heal *Prunella vulgaris* and meadow

vetchling *Lathyrus pratensis*. The aim is to create foraging habitat throughout the bumblebee nesting season, with some areas managed to provide conditions for later flowering species such as common knapweed *Centaurea nigra* and devil's-bit scabious *Succisa pratensis*. Creating new patches of habitat will not only support the Castlemartin Range shrill carder bee population but hopefully help to strengthen it, by providing linking patches of habitat to enable the bee to expand to additional areas of suitable habitat in Pembrokeshire.

Nice place for a walk...

Whilst the main focus of the project is to help the Shrill Carder Bee, the work will also support other bumblebees as well as a wide variety of plant species, other invertebrates and birds. A key part of the project is to provide opportunities to learn about the value of the habitats at and around the Castlemartin Range, and how essential they are to bumblebees such as the Shrill Carder Bee. It will also help to provide an attractive route for everyone to enjoy, from walkers, photographers and bird watchers to mountain bikers, horse riders and runners.

The Pembrokeshire Bumblebee Path Project – so far so good!

Back in April, just as spring was on its way, I visited the Pembrokeshire Coast and undertook a thorough survey of the new path route. I was delighted to find 13 areas (totalling over 10 hectares) along the route that could, with the right management, provide

BBCT

Garden bumblebee *Bombus hortorum*

flower-rich patches to supply valuable forage for bumblebees. This was great news for the shrill carder bee!

I have since been working with the project partners to establish new bumblebee-friendly management in these target areas. In some cases this has involved ensuring stock can't nibble away at the flowers in grassland areas over the summer, allowing important bumblebee-forage plants to flower and set seed. Hay will then be made and taken from these sites, to help provide the nutrient-poor conditions needed for many wildflowers to grow. Other areas that were previously mown regularly throughout the summer are being allowed to grow tall for the first time in years. Ceasing the regular cutting gives a chance for important forage plants such as red clover and common knapweed to grow and flower, providing forage for bumblebees.

On my most recent visit this July I was really excited to visit the 13 target areas and see the initial effects of the new management regime. Even though it is still very early days, I was absolutely delighted to find bumblebees busily foraging on common knapweed, red clover, white clover *Trifolium repens*, self-heal, cat's-ear *Hypochaeris radicata* and bird's-foot-trefoil that were flowering in these areas. I was particularly pleased to find the rare UK BAP priority

BBCT

Brown-banded Carder Bee *Bombus humilis* queen

species Brown-banded Carder Bee and Moss Carder Bee foraging in one area that was rich in wildflowers, which demonstrates how quickly bumblebees will come if the right habitats are provided. Next year we will use local wildflower seed to help bring back wildflowers to many of these new bumblebee havens and are currently looking into purchasing machinery to help us do this. Seed will be collected from the existing wildflower-rich grasslands at Castlemartin, taking care to harvest only small amounts from several areas to ensure the Castlemartin grasslands are protected.

Whilst wildflower-rich meadows and other grasslands are the best habitat for the shrill carder bee, hedgerows, field edges, ditches and banks also provide essential foraging and nesting habitats. We are therefore working to provide the best habitats possible on such areas, which are important in linking larger patches of habitat.

Get involved!

We are also very hopeful that the project will inspire local people to learn more about bumblebees and get involved in monitoring and survey work throughout the spring and summer months. Next summer there will be bumblebee events to raise awareness of the project and hopefully get everyone interested, involved and getting their hands dirty, as some of the local sites may need a little TLC from time to time!

Working throughout Pembrokeshire, and beyond...

The project isn't just working along the path route. I am also hoping to work with landowners in the area who would like to provide more bumblebee-friendly habitats on their land to support the shrill carder

bee. I am particularly interested in sites that are within 5km of Castlemartin and/or the new path route, as these are the most important for linking up the current Shrill Carder Bee population with new areas of habitat. On some sites only small changes in management will be needed to help encourage a diversity of bumblebee-friendly plants, whilst other sites may be suitable for more hands-on restoration or creation of additional foraging and nesting habitats. Not only can I provide advice, but also free wildflower seed to help establish pollen-and nectar-rich flowers for bumblebees on suitable sites.

My work isn't limited to Pembrokeshire either - there are other Shrill Carder Bee populations in Glamorgan and Gwent (as well as in England) that need support. I am already working on projects running in Gwent, which will provide habitat on existing Shrill Carder Bee sites as well as create and restore habitats to link up these sites to other areas of habitat. If you think you could help please get in touch via **enquiries@bumblebeeconservation.org**

To learn more about the Bumblebee Conservation Trust or any of our exciting projects, as well as how you can become a member and support our work please check out our website: **www.bumblebeeconservation.org**

***Dr Pippa Rayner** is Conservation Officer, Bumblebee Conservation Trust.*

BBCT

Bumblebee-friendly paths - artist's impression!

Llwybr Gwenyn Bwm yn Sir Benfro

Mae 24 math o wenynen bwm yn y DU, ac mae pob un, bron, yn prinhau. Pa ryfedd, a ninnau wedi colli 97% o'r cynefinoedd blodau gwyllt cyfoethog sydd mor bwysig ar eu cyfer. Mae gwenyn bwm yn hanfodol i'n heconomi fel peillwyr planhigion a chnydau.

Ond gallwn newid pethau os torchwn ein llewys nawr. Mae cynllun ar y gweill yn ardal Castell Martin i helpu un o'r poblogaethau prin o'r gardwenynen *Bombus sylvarum*. Mae'r maes tanio yng Nghastellmartin yn werthfawr oherwydd yr ehangder o laswelltir sydd heb gael ei amaethu'n ddwys. Ceir 19 rhywogaeth o wenyn bwm yno, ynghyd â chyfoeth o fywyd gwyllt arall.

Y nod yw creu cynefinoedd blodeuog o boptu llwybr newydd ac annog tyfiant hoff blanhigion y gardwenynen arbennig hon - fel meillion coch ac ytbysen y ddôl - a sicrhau cnwd da o flodau hwyr fel y bengaled a thamaid y cythraul. Credir bod modd gwella ansawdd 10 hectar o dir ar gyfer y wenynen drwy fabwysiadu rheolaeth addas, fel pori'n ysgafnach a thorri'n llai aml. Bydd pobl hefyd ar eu hennill, gan y bydd y llwybr hefyd yn denu naturiaethwyr, ffotograffwyr a cherddwyr.

Bwriedir gweithio tu hwnt i'r llwybr hefyd. Mae gwrychoedd, ymylon caeau, ffosydd a chloddiau oll yn gynefinoedd bwydo a nythu pwysig. Bydd y swyddog prosiect yn gweithio gyda thirfeddianwyr o gwmpas safle Castell Martin er mwyn eu helpu i wella cynefinoedd ar gyfer gwenyn bwm. Cynigir cyngor a hadau blodau gwyllt yn rhad ac am ddim!

Ziggy Otto

Saltmarsh Secret Service

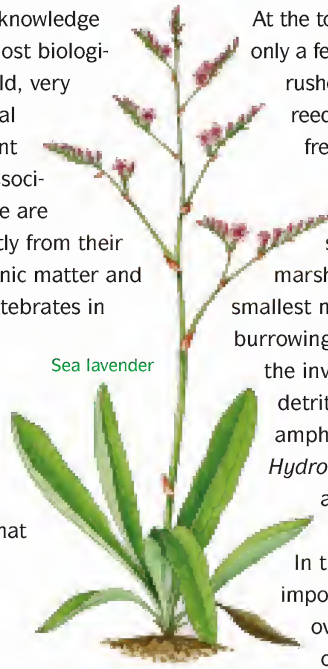
Saltmarsh lamb

One of the most biologically productive ecosystems in the world can also protect us from the dangers of flooding and rising sea levels – yet most people do not recognise the value of saltmarsh and, in the past, have done their best to get rid of it. ZIGGY OTTO opens our eyes to how important these areas really are.

Low, wet, muddy areas periodically or continuously flooded by brackish or salt water… A dictionary definition of saltmarsh does not make it sound very appealing. It would not tempt you into a visit on your next trip to the seaside – better stick to the sandy substrates of beaches and dunes. I must confess, even I became estranged from marshes in the past, no doubt as a direct result of completing my PhD on the saltmarshes along the Severn Estuary – probably the muddiest place in the world (in a Carlsberg kind of sense). It took me years to rekindle the flame of passion I once had. This was helped by the fact that I moved to just north of the Burry Inlet, which contains the largest continuous area of saltmarsh in Wales – a vast 2,200ha of grazed and ungrazed marshes.

Saltmarsh is a key transitional habitat, lying at

the interface between the land and the sea. In the Burry Inlet the marshes comprise a complete transition from pioneer glasswort saltmarsh, via the full range of saltmeadow communities, to sand dune and freshwater habitats. It is not common knowledge that saltmarsh is actually one of the most biologically productive ecosystems in the world, very similar, in fact, to rainforest and tropical mangrove swamp. There are many plant and animal species that are directly associated with the saltmarsh itself and there are even more species that benefit indirectly from their high productivity, as they provide organic matter and nutrients for fish and a variety of invertebrates in adjacent marine habitats.


Sea lavender

Who would have thought that those muddy, grassy areas commonly found fringing Welsh estuaries and along sheltered coastlines are actually quite special, and even extraordinary? But what makes saltmarsh so precious – in both monetary and non-monetary terms?

Saltmarsh function

Saltmarshes have important functions both as coastal defences and natural habitats, and the Burry Inlet is no exception in both respects. They act as natural buffers by absorbing the impact of waves, thereby reducing the probability of breaches to sea defences lying in the lee of the marshes. The coastal settlements of Crofty and Penclawdd would certainly be at much higher risk of tidal flooding were it not for the wide, fronting marshes that protect them. Consequently the socio-economic value of saltmarshes, in terms of shoreline stabilization and coastal flood control for low-lying coastal communities around the Burry Inlet, should not be underestimated.

The value of saltmarshes for wildlife has also long been recognised. The diversity of fauna and flora reflects interactions between the two major elements of the habitat: the marine environment and the terrestrial element. Glasswort (marsh samphire) and the common cord grass *Spartina* are found on the mudflat-saltmarsh boundary. In the central areas of the saltmarsh are eye-catching sea aster, sea purslane, marsh orache, red fescue and common sea lavender, usually towering above a carpet of common saltmarsh grass.

At the top of the saltmarsh, covered in seawater only a few times a year, grow mainly grasses, rushes and sedges, giving way to common reed or creeping bent-grass in the more freshwater areas.

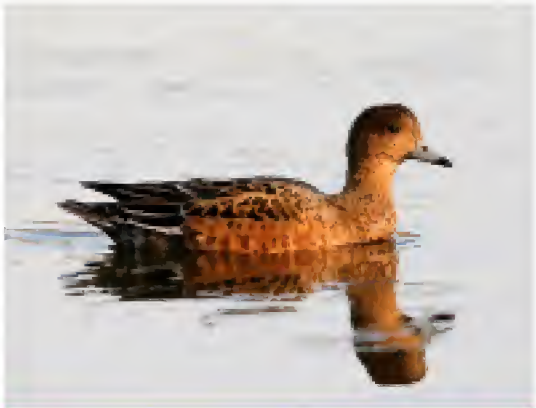
There are many varied and abundant species occurring in and under the marsh surface, ranging in size from the smallest mud-dwelling molluscs to quite large burrowing crabs. In the higher and drier areas the invertebrate fauna is largely limited to detritivores – scavengers such as the amphipod *Corophium* and the gastropod *Hydrobia*, which feed on dead plants and animals or their waste.

In the Burry Inlet the marshes provide important feeding and roosting areas for overwintering waders such as knot, oystercatcher, redshank, dunlin, curlew and grey plover, and for overwintering wildfowl such as wigeon, shelduck, pintail and shoveler. The creeks of the tidal marshes are important spawning sites,

Chris Gomersall/RSPB

Dunlin

Andy Hay/RSPB



Wigeon

nursery areas and refuges for many fish and shellfish species, such as sea bass fry that colonise the creeks during the flood tide and return to coastal waters on the following ebb tide.

The best term to describe saltmarsh ecological function is that of 'nutrient factory'. Just like any other manufacturer, the saltmarsh is concerned with production, transformation, storage, recycling and exportation – but of nutrients that form the all-important part of the marine food web. In addition, saltmarshes have an important function in controlling waterborne pollutants: terrestrial runoff and tidal waters flow through the marshes, resulting in the effective storage, dilution and stabilisation of pollutants in the process.

Saltmarsh lamb

No article on Welsh marshes in general, and those of the Burry Inlet in particular, would be complete without mentioning saltmarsh lamb, advertised locally as delicacy, and its flavour is indeed second to none. These lambs, however, come at a price – not only to the consumer, but also to the sheep themselves. Anecdotal evidence, provided by Vicki Williams of Weobley Castle Farm (North Gower), suggests that the ewes' teeth wear down more quickly than those of sheep grazing in a conventional field, and that after five years of age the sheep show signs that they are *failing to thrive*, a phenomenon not usually seen in field sheep until much later in life. On a more positive note, sheep grazing on saltmarsh for their entire life do not suffer from foot-rot the way field sheep do. This is apparently the result of the regular inundation of the marsh by saltwater which acts as a cleansing and disinfecting agent for the ground the sheep walk on. For the same reason, the worm burden of these sheep appears to be greatly reduced.

Human intervention

Over the past few hundred years, people have had major impacts on saltmarshes through the construction of sea defences that exclude the inundating tides, converting marsh into fields for livestock grazing and growing agricultural crops. While marshes along the south side of the Burry Inlet have been relatively unaffected by enclosure and drainage, there has been significant drainage on the north side of the estuary. There was an area known as Black Marsh near Pembrey, where 240ha have been drained, and there has been extensive construction along the north bank of the estuary at Burry Port. Urbanisation and development of

Ziggy Otto

Ziggy Otto

Glasswort, or marsh samphire

infrastructure around Llanelli have destroyed evidence of earlier geomorphology, but it is estimated that around 600ha of marsh may have been drained here, with a further 28ha enclosed at Yspitty. In contrast to other estuaries around Carmarthen Bay, the drainage of marshes around Llanelli was largely for industrial rather than agricultural purposes. It was primarily driven by coal mining and the associated infrastructure of tracks, roads, tramways, canals and shipping places. Major drainage works occurred following the Enclosure Acts for Llanelli and Berwick Marshes in 1807-1812, and drainage of marshes was virtually complete by the arrival of the railways in the 1840s and 1850s.

Managed retreat

In Wales today, land reclamation is a concept of the past as climate change is upon us, and with it a steady if not accelerating rise in relative sea level. It is widely accepted nowadays that maintaining existing coastal defences will become increasingly expensive, and there can be no doubt that some of the reclaimed land will need to be surrendered to the sea in the future by way of 'managed retreat', also called 'coastal realignment'. In the Burry Inlet, however, opportunities for managed realignment are very limited, as the southern side of the estuary has already a well established saltmarsh which appears to be in good condition, while the drained marshes on the north side of the estuary are now largely urbanised. The only area that might be suitable is near Pembrey.

Managed retreat is best described as a policy, as well as a process, of stepping back from the present defence position and allowing the intertidal zone to develop the wider profiles which it would adopt under a more natural regime, and to re-establish saltmarsh where it was once lost due to reclamation. We must bear in mind, however, that managed retreat is not the panacea to all our coastal erosion and flooding problems, nor is it a cheap 'do nothing' option. The proposed retreat must be very carefully planned, modelled and predicted, using knowledge of estuarine history, hydrology, sediment behaviour and species present, and feedback from successful natural retreat examples in similar settings. The effects of the retreat on the soil chemistry, tidal regime and wave climate need to be considered before the retreat can be implemented. Natural and managed retreat schemes both have examples of successes and failures, and both have merits and flaws, and all aspects of their implementation must be investigated before any decision is made about which one to opt for.

RSPB

Grey plover

The price of saltmarsh

Understanding the importance of saltmarshes within sea defence and livestock grazing contexts is relatively easy, and allows us to put pound sterling figures on their value. But what price tags would you stick on a nursery area for fish, or a supporting habitat for one bird species, let alone several, or – more difficult still – on contributions to the wider ecosystem and biosphere? Whilst these are still tangible, others are not – how can you price the fragrance of a saltmarsh meadow in flower, mixed with the smell of mudflats during low tide, in the middle of a warm summer's day? These sensual experiences are nevertheless real and of great importance to many of us, although we cannot fix a price for them. If we could, however, there is no doubt in my mind that there would be more, healthy saltmarsh around the coast of Wales.

***Dr Ziggy Otto** is a Senior Marine Conservation Officer with the Countryside Council for Wales (West Region).*

Acknowledgements

Many thanks to Vicki Williams at Gower Salt Marsh Lamb, Weobley Castle Farm, Llanrhidian, Gower, for providing interesting information on saltmarsh lamb.

Haelioni'r Halwyndir

Ffatri faetholion. Dyna beth yw morfa heli. Er y llonyddwch arwynebol mae'n llawn prysurdeb. Cynhyrchu, trawsnewid, storio, ailgylchu ac allforio – rhain yw hanfodion y cynefin hwn. Mae morfeydd heli yr un mor gynhyrchiol â fforestydd glaw a chorsydd mangrôf, ac yn cynnal llu o rywogaethau mewn gwahanol ffyrdd. Mae'r cyfarfyddiad rhwng môr a thir yn creu cylchfaoedd gwahanol o lystyfiant, o'r llaid cordwelltog wrth y lan, drwy garped lliwgar o flodau'r morfa, i'r llain o weiriau a chyrs tua'r tir. Mae'n fan bwydo a chlwydo pwysig i rydyddion ac mae cilfachau'r llanw'n lefydd i bysgod silio, magu a chuddio.

Mae morfeydd hefyd yn ein cynnal ninnau mewn amryw ffyrdd. Yn amddiffyn yr arfordir ac yn ein gwarchod rhag llifogydd, yn gwanhau, storio a sefydlogi deunydd llygrol mewn dŵr a ddaw o gyfeiriad y tir a'r môr ac yn ffynhonnell cig oen hynod o flasus.

Cafodd morfeydd eu hadennill yn y gorffennol ar gyfer defnydd diwydiannol ac amaethyddol. Gyda newid yn yr hinsawdd mae'n anorfod bydd rhaid ildio rhywfaint o'r tir i grafangau'r môr ac mae 'enciliad dan reolaeth' yn faes sy'n denu sylw cynyddol o safbwynt polisi a gweithredu ymarferol.

Pe byddem, fel cymdeithas, yn sylweddoli gwir bwysigrwydd morfeydd heli, ac yn gallu rhoi gwerth ar eu hawyrgylch, eu harddwch a'u harogleuon mae'n ddiau y byddai gennym lawer mwy o'r cynefin hwn o gwmpas glannau Cymru.

The River Dee and me

Steve Hughes

The Dee Valley at Llangollen

The River Dee starts in the west of Wales, in the hills of southern Snowdonia, but traverses the country to disgorge into the sea at Wales' easternmost boundary. When ***STEVE HUGHES*** *set out to walk its length he was not sure what he was letting himself in for. Three days, 75 miles and two sore feet later he arrived at the river mouth, older and wiser.*

It was a particularly boggy section of the Llwybr Maelor Way; with every step my boots sank to their laces in the saturated, red-brown sludge of a farm track. I was cold and tired and the ache behind my right knee was becoming more noticeable. Then, despite blue, blustery skies, hailstones began to fall. I realised for the first time that I wasn't going to make this 75-mile, three-day journey.

I looked up for inspiration, but was greeted by the tiny, sparkling metal of a passenger jet, passing high above. Its unwavering march across the skies seemed a form of travel in such marked contrast to my own that it made my journey seem mildly ridiculous. Cresting the hill, I joined a minor road near a collection of brick farm buildings where a farmer was

Mike Alexander

Llyn Tegid/Bala Lake

washing machinery. Even before I asked, I knew the answer. I also suspected he would laugh at me. "No," he said with a friendly chuckle. "There are no buses around here."

I was following the course of the River Dee on foot – from its source in the mountains near Bala Lake, to its flat, broad, re-entry into the Irish Sea. I don't know exactly why I was doing it. I grew up near this river – I fished it, paddled in it, worked in pubs and restaurants on its banks, and crossed its path almost daily. But I didn't attempt to follow its course just to describe the landscape – a photographer would stand a much better chance. Psychogeographer and author Will Self doubts "that there are still discoverable terrains...and ways of traversing them, so as to be able to convey their 'novelty' in words." I set out for reasons other than this, though I have already slipped into doing it, and will no doubt do so again.

Perhaps my real reason was that I hoped to reconnect with the river – something that was so intrinsic to my childhood. Or maybe it was a way of saying a final goodbye. Since leaving North Wales during the mid-90s, I've drifted progressively further away to towns and cities across the UK and beyond. I now live in Vienna, Austria, and have young children of my own who will have childhood memories very different from mine. More probably though, this walk was a way of returning to some sort of base in order to explore who I have become since I've been away.

If an essay is a loose sally of the mind, as Dr Samuel Johnson once said, then walking seems a good way of preparing to write one that attempts to come up with answers. Humans have a long history of walking to think. In his 1861 essay *Walking*, the American naturalist and philosopher Henry David Thoreau contemplated topics as diverse as English Literature and studying Hebrew. Jean-Jacques Rousseau strolled and philosophized.

I have also clung to something Rebecca Solnit noted in *Wanderlust, A History of Walking*. "My circuit was almost finished, and at the end of it I knew what my subject was and how to address it in a way that I had not six miles before," she writes. "It had come to me not in a sudden epiphany, but with a gradual sureness, a sense of meaning like a sense of place. When you give yourself to places, they give you yourself back."

The Dee's source on the slopes of Dduallt, south-west of Bala Lake, is a silent, apocalyptic place, where not even the call of a corvid breaks the remarkable quietude. From Bala to Llangollen though, buzzards soar over the narrow, steep-sided

valley and the river becomes progressively more mature; youthful babblings give way to something broader, deeper and darker – calm meanderings cut banks into small cliffs and uproot ancient trees. It's flanked by secret worlds of fishing beats, disused railway lines and secluded sheep farms in whose yards broken cars and tins of chemicals rot.

Through Overton and Farndon, corvids and wood pigeons work a flatter, wider, ploughed landscape, where occasional pre-fabricated and clapper-board houses lend the place a feel of the American South. Approaching Chester, the river wends grand and stately; as I glimpsed the city's spires through glowering mist, pupils from the Kings School or another of the city's rowing clubs sculled by silently, past Victorian and Tudor mansions with elaborately landscaped gardens full of arbours and rose beds. Further on, wooden kiosks proffered ice creams, black-headed gulls scavenged around mock steamboats with names like *The Mark Twain Showboat*, and tourists threw bread to ducks – and at cormorants.

Woefully behind schedule, I caught a bus for the final section of the Dee; my legs were finished. From Chester, the X-11 lurched through Saltney, Hawarden and Queensferry, past housing estates, leisure centres, high schools and factories, until it finally reached Flint. I walked down to the estuary through back-to-back terraces, past the River Dee Community Church, the all-in-one Flint Town United Football Club and Social Club, and a sycamore tree with a pair of trainers hanging from its upper branches. A background soundtrack of a police siren, barking dogs and a wheel-spinning car in a nearby car park kept me company.

All the river could do now – flanked by pylons and power stations – was seep exhausted into the sea. A Conradian scene in the darkening February afternoon unfolded before me; the grey sea and sky were welded together without a joint and the Dee ran out in a vanishing flatness.

Since this was a solitary walk, my infrequent

Steve Hughes

The Dee at Erbistock

interactions with other humans along the way seem vague and surreal. An elderly couple smoking cigarettes on the porch of a static caravan near Llangollen invited me in for a cup of tea – a gesture of kindness almost of another era. A whiskered, cardigan-wearing landlord in the Dee Inn in Flint – a dark, well-worn pub, with a nook for every regular – twirled glasses before pouring pints of bitter, like some lost-at-sea cocktail waiter. A restaurant owner described how as a child, he'd looked onto Bala Lake from a hill, and seen a distinctly-coloured channel of water flowing straight through it. "That's the Dee, son," his father had said, and the man swore he'd seen the phenomenon dozens of times since. A fisherman said the gwyniad fish – unique to Bala Lake after being trapped during the last ice age – has a smell indistinguishable from cucumber.

It's taken me a lot longer to enjoy anything like the clarity Rebecca Solnit gained, even though I walked a lot further. I'm writing this from my home, my journey now an increasingly jumbled set of experiences, hundreds of miles away and many weeks old. But just as I recognized the River's personality, I think it recognized mine.

I arrogantly underestimated the physical challenge: 75 miles over three days was too much for me. I'd planned badly, factoring in no time to get lost, so

Darganfod y Ddyfrdwy – a dod i 'nabod y dyn

Does 'na ddim byd fel cerdded i lacio'r meddwl. Ac mae cerdded glannau'r Ddyfrdwy, o'i tharddiad i'w cheg, yn gystal llwybr ag unrhyw un yn enwedig i grwydryn sy'n ceisio ail gysylltu â'i orffennol pan oedd yn byw ac yn chwarae ar ei hyd – neu efallai'n ceisio ffarwelio'n derfynol â thirlun ei lencyndod.

Mae'r dirwedd ar hyd y Ddyfrdwy yn newid yn syfrdanol - o'r llonyddwch maith ar y Ddueallt uwchlaw Llyn Tegid, i lawr at ddyffryn cul Edeyrnion lle mae'r afon yn dolennu'n dywyll dan dorlannau serth ac o gylch gwreiddiau hynafol, ac yna at y gwastadeddau ger y ffin lle mae'r brain a'r 'sguthanod yn swnllyd o brysur dros rychau moel y caeau âr.

Ac yna, o osgeiddrwydd dinas Caer gyda'i thai crand, ei chabanau hufen iâ a'i chlybiau rhwyfo, mae'n gwau'n llonydd rhwng 'stadau, ysgolion a ffatrioedd nes cyrraedd Fflint yn llwyd a lluddedig. Oddi yno, llifa'n dawel i'r môr nes toddi'n un â'r awyr ar y gorwel.

Fel y mae rhywun, ar daith o dridiau a thros bellter o 75 milltir, yn dod i 'nabod cymeriad afon fe ddaw'r afon efallai i 'nabod cymeriad y cerddwr hefyd. A'r siwrne at y canol, efallai, yw'r siwrne bellaf un. Ymgollwch mewn lle, ac fe ddarganfyddwch eich hunan yno.

Rivers Dee (left) and Mersey enter Liverpool Bay

that rather than enjoying the inevitable wrong turns and dead ends, they made me angry and anxious. My childhood ability to identify trees, plants and birds has withered, so I felt too ignorant to wander off piste; I began to follow a disused railway, but gave up, worried about trespassing and upsetting wildlife, and feeling out of my depth. When I rejoined a nearby road, I felt eminently more at ease. And at one stage, crossing a field, I found a dead sheep whose eyes had been pecked out. Minutes later, I was surrounded by lolloping lambs. I was shocked by the natural cycle of life, so close at hand, and by my naivety.

"Everyone who lives in a city will know the feeling of having been there too long," writes Robert Macfarlane in *The Wild Places*: "The gorge-vision that streets imprint on us, the sense of blockage, the longing for surfaces other than glass, brick, concrete and tarmac." But I'm still excited by cities – and by the way people, animals and plants adapt to and thrive in them. When I'm finally ready to leave, maybe for a return to some semblance of rural life, I'll need to relearn the countryside. It seems I've already been away too long.

***Steve Hughes** grew up in North Wales. He now lives and works in Vienna, Austria, where he also writes a monthly nature column for the Vienna Review newspaper.*

Peter Wakely/Natural England

The Dee Estuary

Peatland Secrets

All photos: Mike Peacock

Cottongrass and heather

A large block of windswept moorland in north Wales vies with the Berwyn to be the largest tract of blanket bog in Wales. The Migneint has a secret life, with carbon at its heart. This enables it to perform a very important function, as ***MIKE PEACOCK*** *explains.*

The Migneint is the wilderness of north Wales: an empty expanse of bleak moorland extending as far as the eye can see. Its mossy, peaty sweep is only occasionally punctuated by a lake or road, and it is home to just a handful of dwellings. Hen harriers and merlins find homes on this huge upland, and rare and interesting plants also abound.

The Migneint also holds another secret: carbon. Globally, peatlands store one third of all soil carbon. It has been calculated that UK peatlands store the equivalent of thirty-five years of UK carbon dioxide emissions. This huge figure is all down to waterlogging and a

Drainage ditches

lack of oxygen. These conditions shut down decomposition through a mechanism known as the 'enzymic latch'. The conditions cause an enzyme called phenol oxidase to "switch off", causing the natural preservative chemicals that the enzyme normally destroys (phenolics) to build up in the soil. These compounds then block the action of the vast range of enzymes that cause decomposition. It is this mechanism that keeps bog bodies amazingly well preserved, even for thousands of years.

Carbon loss

During the last several decades it has been observed that carbon is being lost from peatlands. Although no one is yet one hundred percent sure of the reason for this, numerous studies have demonstrated that droughts and rising temperatures play a part. If droughts become intense enough, then they open the enzymic latch. Soil decomposition takes off and large amounts of carbon dioxide are released. In this way a feedback is established – climate change enhances carbon losses, which in turn boost atmospheric greenhouse gas levels causing even more climate change.

In the past, peatlands have been exploited for many reasons. But one stands out in particular; thousands of kilometres of ditches have been dug across them, in attempts to drain and improve the land for grazing and forestry. Standing on the Migneint today, numerous lines of deep parallel ditches can be seen marching down slopes, as if a giant comb had been drawn across the landscape.

As well as being an unsightly and unnatural intrusion into the landscape, these ditches alter the biogeochemistry of the land. By carrying water away they lower the water table, and allow oxygen into the soil to open the enzymic latch. These oxygen-rich conditions are ideal for the microbes, which then produce even more carbon dioxide to enter the atmosphere.

Retaining water

Now, the National Trust, which owns much of the Migneint, is funding an extensive programme to block these ditches and restore the land to its original state. By blocking the ditches the water table will be raised to a level similar to that found in a pristine peatland. The increase in waterlogging will starve microbes of oxygen, close the enzymic latch and cause a decrease in carbon dioxide emissions.

Erosion allows carbon to be released

The work will involve detailed scientific study by Bangor University and the Centre for Ecology and Hydrology (CEH), and is being funded as part of a pioneering programme called KESS – Knowledge Economy Skills Scholarships. KESS is funded through the Welsh Assembly Government and the European Social Fund. The project will monitor the water and soil chemistry before and after the restoration work for several years to check that the latch has been closed, and that those valuable carbon stores are locked up for future generations.

Of course, the Migneint is no stranger to environmental science. In 2006 the LIFE project was launched with Mike Morris as project manager. The aims of LIFE include blocking ditches, removing trees, controlling wildfires and conserving blanket bogs. The project also had the laudable target of demonstrating the importance of peatlands to local communities and schools. Additionally, the Migneint is the site of one of the CEH Carbon Catchments. There are four of these across the UK, and monitoring takes place to calculate the overall carbon balance of the peatland.

So, the next time you cross the Migneint and look out over its desolate and windswept range, spare a thought for all that lovely carbon hiding in the soil!

***Mike Peacock** is a PhD Student at Bangor University,*
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Barcud coch uwchben y Migneint

Red kite above the Migneint

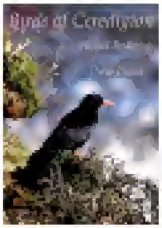
Migneint, Mawn a Charbon

Mae'r Migneint yn llawn cyfrinachau. Carbon yw un ohonynt. Mae'r pridd dwrlawn a'r diffyg ocsigen yn golygu mai araf yw prosesau dadelfennu a phydru; o ganlyniad, cedwir carbon o fewn y pridd.

Gall hinsawdd gynhesach a sychder cynyddol achosi i garbon gael ei golli o'r pridd ar ffurf carbon deuocsid. A bydd hwnnw wedyn yn cyfrannu at newid yn yr hinsawdd. Mae'r ffosydd a dorrwyd gan amaethwyr ar y Migneint wedi helpu sychu'r mawndir a chynyddu lefel yr ocsigen yn y pridd.

Bellach mae'r Ymddiriedolaeth Genedlaethol yn cefnogi gwaith i gau'r ffosydd hyn. Caiff y prosiect ei fesur a'i werthuso'n ofalus. Mae prosiect LIFE, sydd hefyd yn digwydd ar y Migneint, yn cynnwys cau ffosydd, clirio coed, rheoli tanau a helpu pobl i werthfawrogi mawndiroedd. Er y tawelwch mawr, mae'r Migneint yn lle prysur a phwysig iawn y dyddiau hyn!

Green **Bookshelf**



Birds of Ceredigion
Hywel Roderick & Peter Davis
Privately published in association with the Wildlife Trust, South and West Wales 2010
Hardback £16.50

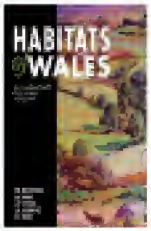
The year 2010 will have historic significance for Ceredigion, with the publication of the first county avifauna for 44 years and the first county flora for 75 years. The original avifauna, *The Birds of Cardiganshire*, by Geoffrey C S Ingram, H Morrey Salmon and W M Condry, was published in 1966. Although a soft-cover production running to only 85 pages, it brought together a wealth of information, particularly from the records of Professor J H Salter, the first Chair of Botany at Aberystwyth (1891-1908), who also produced the first flora in 1935.

It appears that sometime in the early 1990s William Condry encouraged Hywel Roderick and Peter Davis to produce an update to the 1966 avifauna. This took longer than expected, with Hywel making the running and devoting at least 15 years of his spare time to it, and Peter Davis acting as co-author concentrating mainly on the historical aspects. Sadly, the book became Hywel's memorial, as he died of cancer in January 2009 before the work was completed. It fell to Peter to complete the book, and together they have produced what can only be described as a classic avifauna of the highest standard.

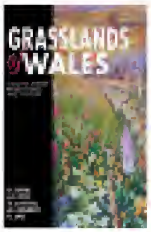
The hard-cover book runs to 302 pages and is outstanding value for £16.50. It includes 16 pages of colour photographs edited by Michael Hayward, these being of various notable bird species and a selection of important Ceredigion sites and habitats. The first part of the book contains very informative chapters on the history of bird recording in Ceredigion; the county's geology, main habitats and climate; changes in breeding bird populations during the 20th century, and on the conservation of birds in the county – all written in a most readable style. Then follows a detailed and meticulous systematic list of recorded species, conforming to the latest British Ornithologists Union List. The individual species accounts are subtitled 'historical review', detailing species recorded before 1966, followed by recent status, summarising bird records since 1966. Remarkably, the records have been evaluated up to 2007 (although some survey results were only available up to 2006 or earlier) so this is a really up-to-date account of Ceredigion's birds.

The book continues with 13 appendices, ranging from previously published records no longer considered acceptable, to the breeding success of chough at coastal sites, 1991-2005. As if that is not enough, there follows a list of references, a gazetteer of place names, a species index and a county map. What more could one want – this is a truly momentous book reflecting the enormous dedication and expertise of the authors and providing all who care for the birds of Ceredigion with a feast of knowledge.

Chris Fuller



Habitats of Wales
Blackstock, Howe, Stevens, Burrows & Jones
Hardback £55



Grasslands of Wales
Stevens, Smith, Blackstock, Bosanquet & Stevens
Hardback £70
University of Wales Press, Cardiff, 2010

CCW has published its own 'biodiversity domesday accounts' in the International Year of Biodiversity 2010; the year is a sobering reminder of our failure to halt biodiversity loss. *Habitats of Wales* and accompanying *Grasslands of Wales* are a tribute to the foresight of staff in the Nature Conservancy Council, who initiated the field survey in 1979, and colleagues in its successor body, the Countryside Council for Wales, who completed it in 1997. Wales is the only country in the UK to have such a detailed inventory and description of the plant communities of its terrestrial habitats. The stated aim of the Habitats volume is to "give an overview of the habitat composition of the landscapes of Wales". It contains useful introductions to our historic knowledge of habitats and to the geology, geomorphology and quaternary history of Wales. A chapter is devoted to each habitat and well illustrated with distribution maps, NVC community lists and excellent colour photographs.

The Grasslands book explains how the pioneering Phase 1 survey of the Habitats book led to detailed Phase 2 surveys between 1987 and 2004. The grassland plant communities are described in detail, using the NVC classification, with more photographs, figures and lists of the sites in each of the survey areas. These surveys were training grounds for botanical surveyors and an opportunity to forge relationships with farmers and landowners, some of them practising sympathetic management of flower-rich grasslands.

Will these two volumes inspire other farmers and landowners to look after this important legacy of past land use, or help decision makers write and implement policies to support them? The 2008 BAP Report for the UK shows that, in Wales, 53% of priority habitats are considered to be declining or probably declining. This is very gloomy news but there are plenty of examples of positive conservation action and it would have been good to read of these in both volumes. These pricey Domesday Books are a statement about the distribution and make up of the habitats of Wales at the end of the 20th century. Like the Domesday Book of 1086, they will be fascinating 'quarries' of information for those charting the history of nature conservation and wanting to understand more about the period in which they were written; maybe some of those historians will be lucky and find a remnant habitat!

Joanna Robertson
CCW's Biodiversity Action Coordinator 1996-2010

Bugs Britannica
Peter Marren
Chatto & Windus, London 2010
£35

I had something to do with researches for the first in the monumental 'Britannica' series, *Flora Britannica* by Richard Mabey, and although a wonderful publishing enterprise, I never thought the public would take it to their collective heart as they did. Plants were clearly engraved in the national psyche.

In the right hands the formula clearly works, but would this public appetite transfer to bugs? The grounds for optimism lie in both author and subject. No one writes as lucidly and entertainingly about nature as Peter Marren. His forays into the natural history of dragons and of leeks in this magazine are evidence enough. His strengths as an all-round naturalist are underlined by an appreciation for creepy crawlies as both marginalised 'wildlife underdogs' but also creatures of unrivalled reach and influence on every corner of the planet.

His enthusiasm for bugs is enriched by a childhood passion for butterflies and moths, whose designs amaze with exuberance and beauty, but also with subtlety. Then there are the names which unite naturalist with word-enthusiast. Added to which the author is a bibliophile and historian who loves to winkle out obscure but delicious little facts about his subjects.

Bugs Britannica may have found the right author, but has it worked? Do bugs have as much appeal as the earlier Plants and Birds titles?

For me, the answer is an unequivocal 'yes'. I am yet to read every entry, for 500 pages is good publishing value for money, but I have found myself carried along, absorbed by the drama of bug life and the web-like connections to our own species. Having looked up one entry, I find myself half an hour later having moved, for example, from scallops to razorshells, gapers, piddocks and shipworms, and then on to oysters.

Whether the information is familiar, new or faintly rings bells, it is presented with clarity and interest. Above and beyond its role as a bugs dictionary, there to satisfy curiosity and answer questions, it is an entertainment. For this, praise is due to the author, and, of course, to the bugs themselves.

James Robertson

Green **Bookshelf**

Llwybr Arfordir Ceredigion Coastal Path
Phil Jones, Gomer Press 2010
Hardback £19.99

A beautiful gallery of photos showing an idyllic view of the 60 mile long Ceredigion coastal path – not a caravan in sight, almost always a blue sky, and where the dolphin pauses long enough for you to focus. If you were to read just the words in English or in Welsh you'd skip through to the end in less than 30 minutes. But the photos are what it's all about, interspersed with a bit of history, nature and poetry. Don't expect route details – this is inspirational not directional.

The north to south journey is broken into nine segments starting with Ynyslas to Borth, then Borth to Aberystwyth and so on. I recognised and enjoyed these first segments bringing back the best of fond memories from childhood holidays and student life. But I was intrigued and motivated to explore the rest of the less familiar coastline. I want to go, to find the fish traps built by the monks of Strata Florida, the giant's tooth at Llangrannog, and to find out whether there really are concrete puffins at Ynys Lochtyn.

Having done the book, I've got to do the path – that must be a measure of its worth.

Huw Jenkins

A Single Swallow
Horatio Clare
Vintage, London, 2010
£8.99

I was much taken with Clare's first book, *Running for the Hills*, a memoir about growing up on a smallholding in the Brecon Beacons, (reviewed in *Natur Cymru* 19 p.42). It had marked him out as a special writer, whose material came from deep within and from nature all around. How would the new book compare?

Swallows are the *leitmotif* in this composition, the spirits which he follows, from South Africa to his home in South Wales. Emerging from deep Congolese forest, lost to the world, he sees a swallow, which vindicates his journey, and he feels blessed. Perhaps it is the swallows that are following him.

Moving, at times poetic, although listed as 'nature writing/travel', this is really a travel book. Do not expect a natural history of the swallow; Clare's insights into the lives of these magical birds are strictly unscientific, as when he remarks that the only reason he can think of that swallows risk their lives flying between spray-bursts and cataracts of water is that they do it for fun. As with crows that hang upside down on telegraph wires, who can disagree with the thought that birds just wanna have fun?

Clare's journey is a psychological one, testing the borders of sanity, hoping that his adventure will transform him from boyhood to manhood. Like the swallows, he is looking for a mate, and he finds one. He is a romantic, the book a romance. Most of all, the journey is a literary passage, a writer gathering material for a book.

That sense of travelling alone, seeing places and people of vivid difference to what you know, is what gives travel writing its winning formula. Clare uses the formula but adds to it, mixing memoir, travelogue and empathy with the natural world into a distinctive blend. He returns to British shores and is baffled at the way people live and all the things they think they need.

It is always possible to find some small flaw to point to, and in this case it is a general one. Publishers no longer seem to employ editors to correct the errors which every writer makes. When within a couple of pages 'the rain bought bugs onto the road' and 'a man took a good look at the Mousebird and I', the spell of the writing is briefly broken.

This doesn't detract significantly from Clare's achievement. His description of 'the yellow logging trucks which rumbled through the forest in an irregular stream' is chilling; yet we share guilt for the horrors that are befalling Africa's remaining forests. Clare has something important to say about the way we should try to live with nature, and the rewards that can bring.

James Robertson

Nature at large

The Chinese Mitten Crab in Wales

A new non-native invasive species has arrived in Wales, presenting yet another threat to the ecology of our freshwater habitats. The Chinese Mitten Crab *Eriocheir sinensis* seems an unlikely addition to our fauna; freshwater crabs have not been familiar to us in the UK. It joins the other non-native crustacean, the signal crayfish, as an unwelcome but impressively large invertebrate in our rivers. The impacts of its arrival are likely to be damaging and its continued spread seems certain.

The Mitten Crab has been a problem in Germany since the 1920s and in the Thames in England for over 25 years (Colclough 2009). It has spread north from the Thames as far as the Tyne and has reached the Mersey (but was found in the Welsh Dee a year earlier) (Breslin, 2009). But it was only first detected in Wales by Max Gooch (an Environment Agency Fisheries Officer) in the estuary of the river Dee in 2006. Since then, reports on the Dee and its tributaries have been increasing for, unlike native crabs, this species can exist in salt and fresh water. It also wanders around out of water, as witnessed by Welsh Water/ Dŵr Cymru staff, who phoned the Agency in 2008 to complain about 15 crabs roaming around their water treatment works at Huntingdon weir. Then, this year we received positive identification for this species from the Conwy estuary. No records have yet been received from the Clwyd so it's uncertain whether the crabs got to the Conwy by natural spread or were inadvertently transported by boat traffic, in fishing bait or with mussel spat etc.

The crab grows to a relatively large size and spends most of its life in freshwater. It is named after its conspicuous furry claws (mittens) the function of which is not known. Excellent identification material is available at the GB Non-Native Species Secretariat website.

After 3-5 years spent in rivers, adults migrate downstream to reproduce in the autumn or early winter. They undergo their final moult, then becoming sexually mature, and gather in large breeding "swarms" in estuarine waters. Female Mitten Crabs lay 250,000 to 1 million eggs per crab, a rate of reproduction that adds to this species' dramatic capacity for invasion. Eggs are carried by the females until they hatch in spring. The larvae are initially planktonic, then, upon becoming crab shaped, become benthic (bottom-dwelling). Juvenile animals gradually migrate to freshwater. The upstream distance of spread may be controlled by food availability and population size, but migrations of hundreds of kilometres have been recorded in Asia and in Europe.

Impacts on aquatic habitat are varied and potentially quite serious. The crabs have a habit of burrowing, particularly in intertidal areas of rivers. In the Thames, flood banks and walls have been undermined and damaged by this activity. Mitten Crabs are a large and successful predator living on a range of food including other invertebrates and fish eggs, leading to impacts on river ecology. It is thought that burrowing can undermine banks, increase erosion and turbidity, and result in the siltation of gravel beds.

Control options (to prevent further spread or remove this unwelcome species) seem limited. There have been numerous trials of control methods in Europe, none of which have proved successful. These have included trapping autumnal migrants at weirs in Germany (where tens of thousands have been used as fertiliser) and attempts to harvest for consumption in the Netherlands. Numbers have not been affected by these efforts however (Colclough 2009). They are edible but there are concerns that encouraging trade may also encourage deliberate seeding out of this species rather that limiting their population. The EA and CCW are hoping to monitor populations and future control/ management options are being considered by Wales' Non Native Species Forum. It seems they are a species that is here to stay and may be coming to a river near you soon.

Dave Thorpe

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Diogenes, Small Hermit Crab

To classics scholars or pub quiz enthusiasts the name Diogenes brings to mind an ancient Greek philosopher inhabiting a barrel. To biologists familiar with sand beaches on the west coast of Wales it may recall warm summer days paddling ankle deep at the edge of the surf with very small hermit crabs scuttling about.

A significant number of marine organisms have scientific names with classical allusions. *Diogenes* was an obvious name for a genus of hermit crabs, living as they do in barrel-shaped shells. However, *Diogenes* was originally described under several different names from different parts of its geographic range. It first came to notice in the British Isles in about 1850 when Lewis Weston Dilwyn (1778-1855) provided specimens from Worm's Head on Gower which were figured by Thomas Bell in his 1858 *British Stalk-eyed Crustacea*.

Thought to be a new species, it had been called *Pagurus Dilwynii*. Dilwyn was variously manager of the Swansea pottery and later an MP, as well as being an eminent botanist, conchologist and a Fellow of the Royal Society. Later it emerged that the same species had been described in 1829 from the Mediterranean, so now the name of an early Victorian Swansea naturalist only lives on in the list of synonyms for *Diogenes pugilator*. Its standardised common name Small Hermit Crab seems far less memorable than simply referring to it as 'Diogenes' in English or Welsh.

Out of about 20 species of hermit crabs in British waters, *Diogenes pugilator* is the only one found regularly that has the left chela (claw) as the larger. Most gastropod shells have a sinistral spiral, so a larger right chela better protects the shell aperture when the crabs withdraw into their shells. The likely reasons for *Diogenes* being a south-paw probably lie in adaptations to a particular niche habitat. These hermit crabs live on moderately exposed and gently sloping sandy coasts, usually being found between the level of mean low water of spring tides and 4m depths offshore. On such beaches the waves spill rather than plunge, producing flows that surge back and forth over the sea bed. The crabs overcome this by sticking the larger chela out at right angles, so limiting the shell from rolling. They can bury themselves in the sand in only 10-15 seconds while the larger chela acts as an anchor. Thus on certain types of beach Diogenes has a competitive advantage over the common hermit crab *Pagurus bernhardus*, which cannot do this and is much slower to re-emerge after being rolled over. Knowing more of the adaptations to habitat suggests that Dilwyn's specimens came from Rhosilli Beach, where 160 years later they still occur, rather than on the nearby rocks of Worm's Head itself.

Another contemporary of Dilwyn, with a Swansea connection, was John Gwyn Jeffreys (1809-1885). Jeffreys was the expert of his day on marine molluscs and between 1862 and 1869 published a multi-volume book that remained a standard work on British bivalves into the 1960s. Jeffreys was a solicitor, but seems to have devoted more of his energies to conchology and was able to undertake dredging expeditions to make collections using his own yacht. Two hundred years after his birth the National Museum Wales (NMW) put on an exhibition to mark his achievements. Some of the locations where Jeffreys obtained less common species were re-sampled by museum staff in 2008. Over many decades a very substantial mollusc collection has been built up at the NMW, so the museum's reference material for this group is probably the most comprehensive in Britain. The ability to correctly identify organisms is, of course, fundamental to all studies of biodiversity that in turn underpin the sustainable use of resources and conservation. Readily available literature is vital for this, so it is appropriate that as the web replaces printed volumes, an open online reference work *Marine Bivalve Shells of the British Isles* should be produced by Graham Oliver and Anna Holmes at the museum. Unlike many identification guides to shells it also includes many photos of the juvenile stages, which often differ in shape and ornamentation from the adults. It covers all British and Irish waters out to depths of 5000m. The reasons for identifying organisms may have altered since the times of Dilwyn and Jeffreys, but the new work builds on the groundwork of earlier generations, using modern methods of study and dissemination.

Ivor Rees

Why we need more than one – new uses for natural history collections

A question frequently asked of natural history curators is why there are often dozens of specimens of the same species in museum collections. There are a good many reasons why. Any natural history specimen – provided it is accompanied with data on where and when it was collected – becomes a 'voucher' and evidence that it occurred in a particular place at a particular time. This can be used to plot the changing distributions of species over time, something which has become increasingly important in recent years as scientists try to predict the effects of a changing climate. The specimens, when taken together, can also show how a species varies across its entire range. In the past this was done on purely morphological features such as size and colour and there are many cases where, if you look at a species from either end of its range, you might think they were different. However, if there are specimens collected from across the range it is possible to see how the species changes from one end to the other.

Pine marten skull

Pine marten skins

Amgueddfa Cymru–National Museum Wales

Recent advances in the extraction of DNA from museum specimens has further increased the value of these voucher specimens and demonstrates the necessity of multiple specimens of a species – one would not be enough! An example is research into the genetic diversity of Pine Martens *Martes martes* in Britain and Ireland, being undertaken by the Vincent Wildlife Trust in conjunction with the Waterford Institute of Technology. The collections of Amgueddfa Cymru / National Museum Wales hold 13 specimens of pine marten of known origin. Of particular importance in this case is the fact that six of them were collected from Wales, the only ones available for the study to date. The results for the samples taken from the Welsh specimens came as something of a surprise.

Genetic studies of animal populations use the occurrence of sets of closely linked genes, or haplotypes, to group them. Until the martens of Welsh origin were tested, only one haplotype had been found in Britain and a different one in Ireland. The results from the specimens collected from Wales showed they have a third haplotype and are genetically distinct from the pine martens in Scotland and Ireland. The sample size is very small and the Vincent Wildlife Trust is keen to find further specimens to increase the sample size, but this genetic diversity could have implications for the conservation of the species. None of this would have been discovered without museum collections and, more to the point, collections with multiple examples of the same species.

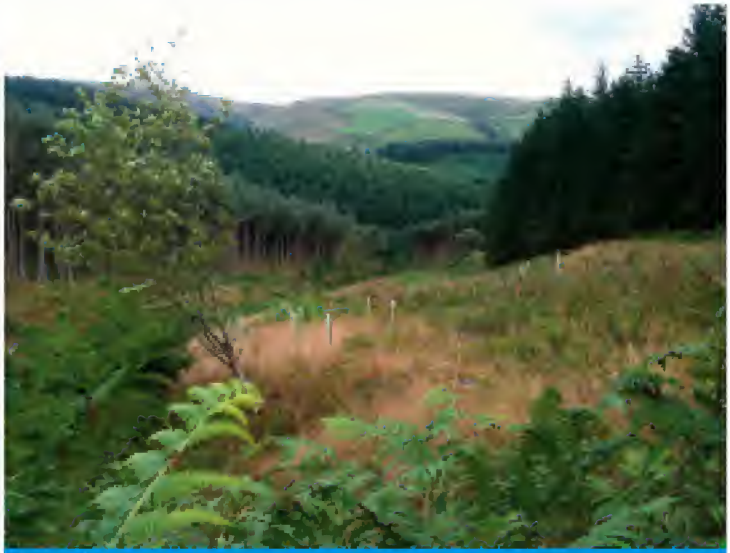
Peter Howlett is the Vertebrate Curator in the Department of Biodiversity, Amgueddfa Cymru – National Museum Wales.

Riparian survey of woodland watercourses in south Wales

The margin of rivers and streams, that strip of land of variable width which is a halfway house between terrestrial and aquatic environments, is hugely important for wildlife.

Riparian areas in woodland can exert a strong influence on the nature of the water environment and can help protect or buffer it from activities on the adjacent land. They provide an important habitat for a number of species, including those that may not be found in the surrounding woodland, and may include protected species such as otters and water voles. Too many livestock with access to a riverside can, by constantly stirring up mud and silt which are then redeposited, ruin important fish spawning areas. Dense stands of conifers along river courses can cause acidification and reduce the biological richness. Checking on the condition of these marginal areas and carrying out appropriate management, such as fencing or tree-felling, can pay dividends in terms of the health of our rivers and streams.

Forestry Commission Wales (FCW) has begun a four-year project to survey 690km of riparian areas in the woodlands it manages on behalf of the Welsh Assembly Government in the South Wales Valleys and the immediate surrounding area. Following the publication of the Water Framework Directive, FCW is working with Environment Agency (EA) Wales to prioritise riparian improvement work on the Assembly Government Woodland Estate (AGWE).



Andrew Sowerby

Streamside corridor within a plantation

Ravine WoodLIFE project

FCW has been involved in a number of large-scale riparian management projects, including the Ravine WoodLIFE project in the Wye Valley. This partnership project involved, amongst others, FCW, Countryside Council for Wales and the Woodland Trust. Work undertaken included: thinning and selectively felling woodland to control non-native trees; bringing areas back into coppice management; and protecting the resulting regeneration from deer browsing. This protection was achieved by fencing to exclude the deer, and by using lop and top from felling operations as dead hedges or as a protective covering for natural regeneration and coppice re-growth.

The project was completed in 2007 and, building on the work, the benefits are continuing. The opening of the tree canopy has resulted in increasing ground flora and regeneration of native trees such as ash and oak. There have been many other positive results: for example, following the clearance of conifers and freeing-up of the seed trees such as beech and ash that they favour, a localised population of hawfinches has grown from 15-20 in 2003 to over 100 in 2010. The resulting improved ground and shrub layer provides the cover they need for feeding on fallen seeds.

Riparian improvement

Other riparian improvement projects in Wales involving land managed by FCW have been the Severn Natural Assets Project and the EA Fishing Wales Objective 1 Project. Work has included removing conifers and planting native broadleaves in Hafren forest in mid-Wales, to improve the diversity of wetland corridors. In addition, ponds were

Hawfinch

created and drainage ditches blocked to recreate marshy areas in upper catchments. Other work has involved the removal of in-stream barriers to improve habitats for fish, and clearance of both mature conifers and naturally regenerated trees along riverbanks.

Riparian zones can be described as the habitat linking the watercourse itself (aquatic zone) with the adjoining land, and determining the 'width' of this area is difficult as it is very dependent on landform, contours and the size of the water body. For this reason a notional 20m width on either side of a watercourse is being used as a guide for the boundary of this new survey. The watercourses to be surveyed are those that appear on a 1:10,000 scale Ordnance Survey map.

Survey methodology

The survey methodology being used has been approved by the Environment Agency as a way of quickly and effectively establishing the condition of riparian zones and watercourses. The surveyors will stop to collect data at distances no greater than 500m. Stops will also be made if there is a change in vegetation and/or habitat type. This will ensure that the full range of habitats along the length of a watercourse is captured.

Information on a wide range of features is being captured, building up a clear picture of the current condition of each watercourse. Data collected includes: habitat classification determined by the structure, diversity and species present; the water pH; and habitat connectivity. Also being assessed is the condition of the watercourse for fish (for features such as erosion, culverts and migration barriers), the conservation value of current habitat, and the threat from non-native and invasive species.

The survey is being carried by a team of specialist woodland and riparian ecologists from AECOM Limited, an international consultancy which has experience in water and natural resource projects throughout the world.

The information provided will support FCW's management at a tactical and operational level, influencing decisions made in the development and implementation of management plans for woodlands containing riparian areas. It will form the basis of management programmes to remove intrusive conifer regeneration and invasive non-native species, remove barriers to water flow, identify sites for enrichment planting and many other interventions that will benefit riparian habitats in the AGWE.

This is a pilot survey which may be extended across Wales to gain up-to-date information on the current status and future management priorities for all water courses on the land managed by FCW.

Rosalind Codd
Conservation and Heritage Manager, Coed y Cymoedd Forest District, Forestry Commission Wales
rosalind.codd@forestry.gsi.gov.uk

FSC Friday
'Working Together to Celebrate Responsible Forestry'

On FSC Friday, 24th September, the Forest Stewardship Council will be raising awareness of the FSC logo as a mark of responsible forestry. There will be events at FSC certified forests, schools, universities and community centers around the country and a range of competitions for all ages with some great prizes.

Last year many event organisers came up with innovative ideas for suitable 'FSC Friday' activities, others wanted advice and ideas. As well as walks, treasure hunts and other forest-based activities, events were also held in classrooms and scout huts and these proved to be very effective in conveying the FSC message.

If you are interested in FSC events near you please check out the website www.fsc-uk.org or contact Project Officer Amruta More on **projectofficer@fsc-uk.org**

FSC-UK Working Group, 11-13 Great Oak Street, Llanidloes, Powys, SY18 6BU. General enquiries: **01686 413 916** or email: **info@fsc-uk.org**

Hysbysfwrdd / Noticeboard

If you would like your wildlife event to feature on these pages please contact us on 01248 387373 or email info@naturcymru.org.uk (entries may be edited). Please mention Natur Cymru if you attend any of these events.

North Wales Wildlife Trust

LACEY LECTURE

15 Oct *Grass, Grazing and a Rural Renaissance,* A talk by Graham Harvey, author of *The Killing of the Countryside* and agricultural story editor of The Archers. Theatr Twm o'r Nant, Denbigh. Further details and tickets: **01248 351541 nwwt@wildlifetrustswales.org**

CONDRY FESTIVAL

The Tabernacle, Machynlleth

16 Oct 10am-6pm. A one day festival of writing and nature commemorating the work of the writer and naturalist Bill Condry. Speakers include: Andrew McNeillie, Martin Wainwright, Jim Perrin, Bethan Wyn Jones, John Fanshawe, Tristan Gooley, Jack Grasse and Niall Griffiths. Day Tickets £15. **www.llgc.org.uk/index.php?id=4030** or **01970 632839**.

CCGC yng Ngogledd Cymru / CCW in North Wales

EVENTS

24 & 25 Medi / Sept Gwyl Coedwig Ynys Môn Woodland Festival, Carreglwyd, Llanfaethlu.

Gym Gwyrdd-Green Gym

Gym Gwyrdd – dyma fenter sy'n anelu at wella eich iechyd. Mae'n rhoi cyfle i unigolion ddefnyddio gym 'awyr agored'. Cyfle i ymarfer corff a gwneud gwaith cadwraethol ymarferol yr un pryd.

The Green Gym is a health initiative offering individuals the opportunity to increase physical activity through direct involvement in practical conservation activities

29 Medi/Sept, Hafod Garregog

13 Hyd / Oct & 3 Tach / Nov Fenns Whixall & Bettisfield Mosses

Manylion/details **0845 1306 229**

Fenns Whixall Mosses

EVENTS

All events (unless stated) must be booked in advance: Caroline Dahn on 0300 060 0583 or e-mail caroline.dahn@naturalengland.org.uk

19 Sept *A Peat-cutter's Life* 1pm

10 Oct *Fungal Foray* 2pm

19 Oct *Why Restore the Mosses?* Slideshow 7:30pm (No need to book).

29 Oct *Halloween Spooktacular* 4pm – 7pm. Fancy dress essential! Suitable for ages 8+.

Field Studies Centres

COURSES, Wales & Borders

Preston Montford, Shrewsbury

20-22 Sep *Using the New Vegetative Key*

1-3 Oct *Mammal Identification*

22-29 Oct *Identifying Difficult Fungi Groups*

29-31 Oct *Autumn Fruits and Fungi*

29 Oct-2 Nov *Moulds, Mildews and Microfungi*

Other centres

Dale Fort, Haverfordwest

Orielton, Pembroke

Rhyd-y-creuau, Betws-y-coed

Details: **www.field-studies-council.org 0845 330 7378 enquiries@field-studies-council.org**

North East Wales Wildlife

EVENTS

23 Sept *Dusk Wildlife Watch* 7pm-9.30pm, Glascoed Nature Reserve, St Asaph. FREE - booking essential.

16 Oct *Autumn Celebration Day* From 11am, fungi foray in the morning and a fair in the afternoon. FREE. Rhydymwyn Valley Nature Reserve, Mold.

30 Oct *Halloween* 6pm-9pm, Rhydymwyn Valley Nature Reserve, Mold. FREE - booking essential.

4 Dec *Christmas Fair* 10am - 4pm, Rhydymwyn Valley Nature Reserve, Mold. FREE - booking essential for Santa Trail

Details: **01352 742115 admin@newwildlife.org.uk**

School of Education and Lifelong Learning, Aberystwyth

COURSES

25 Sept *Permaculture: Sowing the Seeds of Sustainability* 10am - 4pm. Talbenny, Haverfordwest

1 Oct *Pond and Streams - Invertebrate Life* 10am - 4pm. CAT, Machynlleth

15 Oct *Identifying Mosses, Liverworts & Lichens* 10am - 4pm. Denmark Farm, Lampeter

22 Oct *Animal Diversity* 10am - 4pm. CAT, Machynlleth

Course Fees: £75 (£65 Concessions)

Contact: **learning@aber.ac.uk 01970 621580 www.aber.ac.uk/sell**

Wildlife Trusts Wales

The Wildlife Trusts offer a huge number of events and courses all over Wales. Contact them for a full programme.

Brecknock - 01874 625 708 www.brecknockwildlifetrust.org.uk

Gwent - 01600 740600 www.gwentwildlife.org

Montgomeryshire www.montwt.co.uk 01938 555654

North Wales - 01248 351541 frankiehogan@wildlifetrustswales.org

Radnorshire - 01597 823298 www.radnorshirewildlifetrust.org.uk

South & West Wales www.welshwildlife.org 01656 726980 info@welshwildlife.org

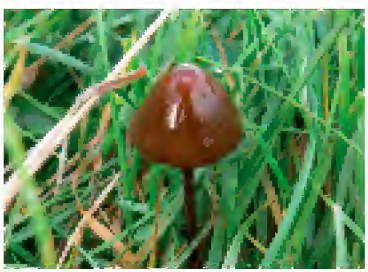
Plas Tan y Bwlch, Canolfan Astudiaethau Amgylcheddol a Gwasanaethau Addysg / Plas Tan y Bwlch Environmental Studies Centre and Education Services

CWRSIAU/COURSES

15-17 Oct *Illustrating Fungi & Autumn Fruits* with Jean Binney, and *Mushrooms and Toadstools*, with optional fry-up! With author and fun-guy Patrick Harding.

Cyrsiau drwy gydol y flwyddyn. Many courses throughout the year.

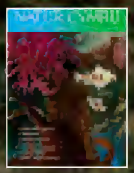
www.plastanybwlch.com 01766 772600 plas@eryri-npa.gov.uk



John Farrar

Diolch am y lluniau i / For illustrations, thanks to: Jean Binney, Patrick Harding, Mandy Marsh, Natural England, Alastair Robertson

Back issues of *Natur Cymru* (Nos 2 - 35) are available priced £3.00



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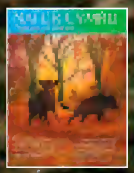

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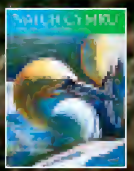

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John Harold

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